8ports Remote I/O Controller

CIE-H10 User's Manual

Version 3.1

Sollae Systems Co., Ltd.

http://www.ezTCP.com

To all residents of the European Union

Important environmental information about this product

This symbol on this unit or the package indicates that disposal of this unit after its lifecycle could harm the environment. Do not dispose of the unit as unsorted municipal waste; it should be brought to a specialized company for recycling. It is your responsibility to return this unit to your local recycling service. Respect your local environmental regulation. If in doubt, contact your local waste disposal authorities.

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1 Introduction

1.1 Introduction

In the era of Ubiquitous Environment, many kinds of systems which use sensors like temperature, humidity or pressure and controlling the power of remote devices have been developing. The CIE-H10 monitors those sensors and controls the remote devices. It detects digital inputs from sensor's outputs and controls the relay outputs. HTTP, Modbus/TCP, serialized Modbus/TCP and Macro mode can be used for these functions. The CIE-H10 can be used in another way because it equipped operation as a serial device server.

1.2 Application Examples

- Remote I/O device server

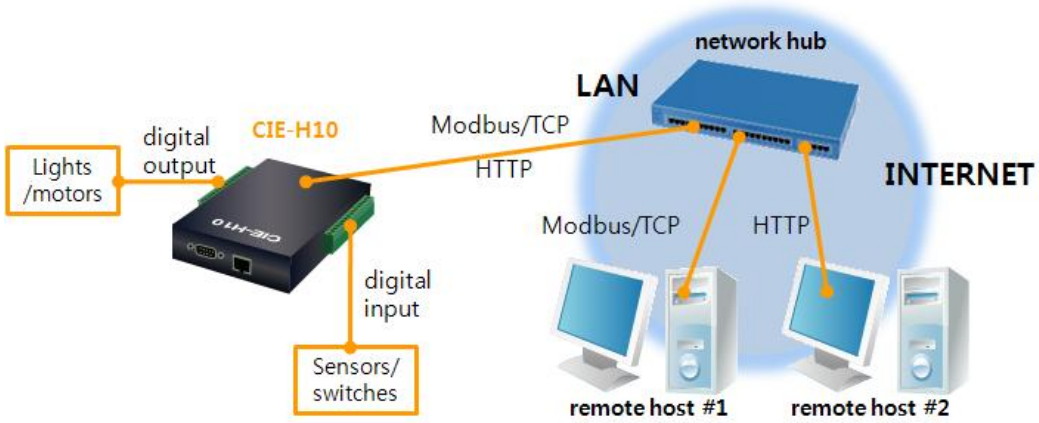

Figure 1-1 remote I/O device server

- Serialized Modbus/TCP

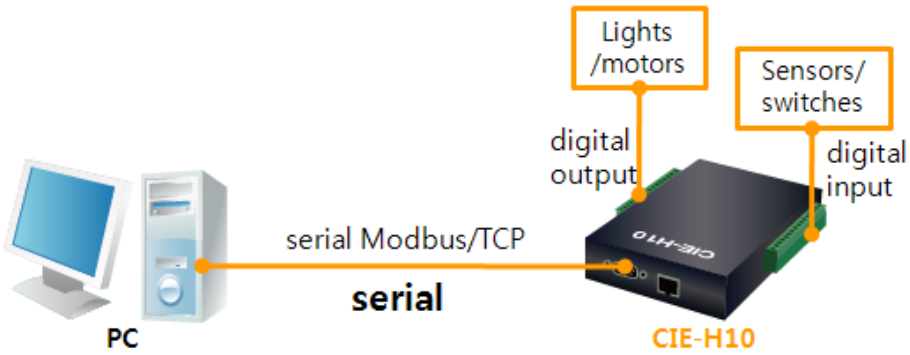

Figure 1-2 serialized Modbus/TCP

- Internet Switch

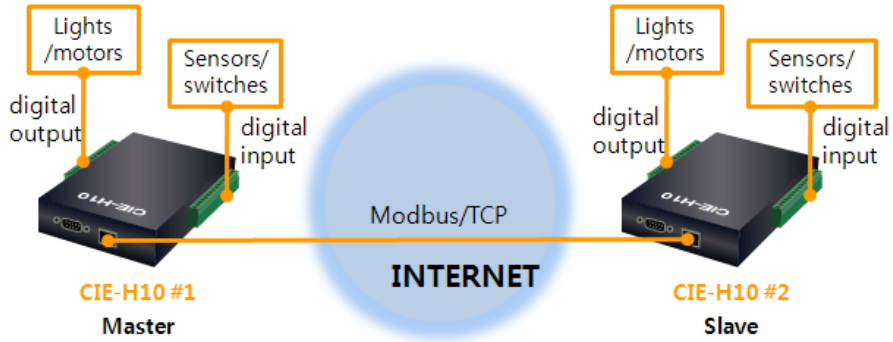

Figure 1-3 internet switch

- Serial Switch

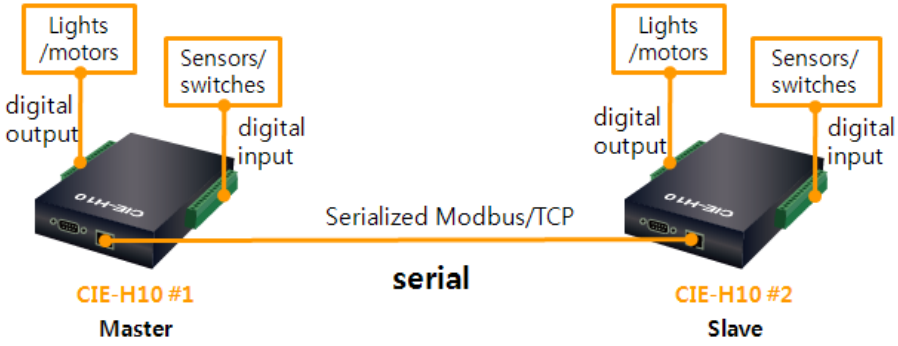

Figure 1-4 serial switch

- Macro mode

Figure 1-5 macro mode

- Serial Device Server

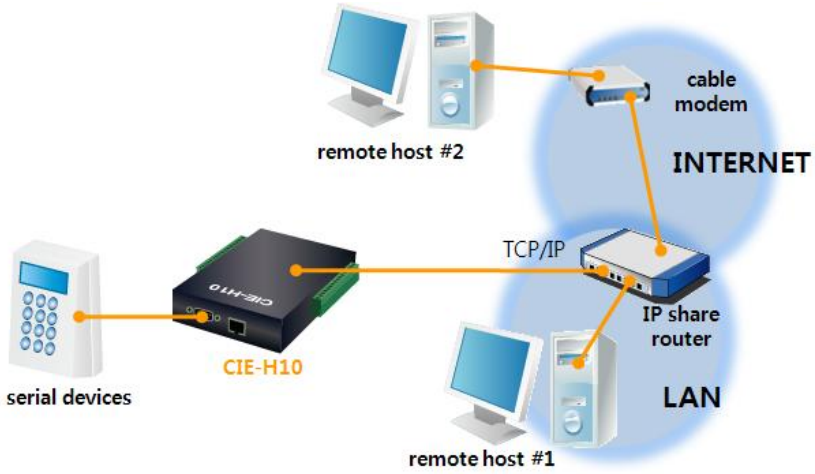

Figure 1-6 serial device server

1.3 Components

- The CIE-H10's body
- 5V Power Adapter
- RS232C Cable for PC (option)
- Adapter for DIN rail (option)
- Dry Contact Adapter (option)

1.4 Specification

1.4.1 H/W specification

Power	Input Power	5V (±10%)
	Current Consumption	510mA typical
Size	153mm x 126mm x 32mm	
Weight	Approximately 530g	
CPU	ARM7 Core	
Interfaces	Digital Input	8 ports with photo couplers
	Digital Output	8 ports with relays
	Serial Port	DSUB 9 pins male
	Ethernet	RJ45
Network	Ethernet 10Base-T or 100Base-TX (Auto-Sensing) Auto MDI/MDIX(Cable Auto-sensing)	
Temperature	Operate: 0 ~ 55℃ / Storage: -40 ~ 85℃	
Certification	CE: F690501/SP-EMC000976 MIC: SLS-CIE-H10	
Environment	Follows Europe RoHS Directive	

1.4.2 S/W specification

Protocol	TCP, UDP, IP, ICMP, ARP, DHCP, DNS lookup, DDNS, Telnet COM Port Control Option(RFC2217), Modbus/TCP, HTTP	
Diagnose	Online Debugging Function	
Operation mode	Normal	Normal communication mode
	ISP	F/W upgrade
	Serial Configuration	Configuration with the RS232 port
Communication Mode	I/O server	Modbus/TCP – Slave/Master, Passive/Active Web Browser(HTTP), Macro(Stand-alone), Serialized Modbus/TCP
	Serial devices server	TCP Server/Client, AT emulation, UDP
Programs	ezManager	Configuration program via LAN
	ModMap	Modbus/TCP Application for Windows

1.5 Interface

1.5.1 Input Ports

Because each of the CIE-H10's input ports are isolated by photo-couplers, users don't need to be worried about the polarity. The circuit of the input port is shown in the figure below. The [EXTERNAL INPUT1] and [EXTERNAL INPUT2] port should be interfaced with the user device.

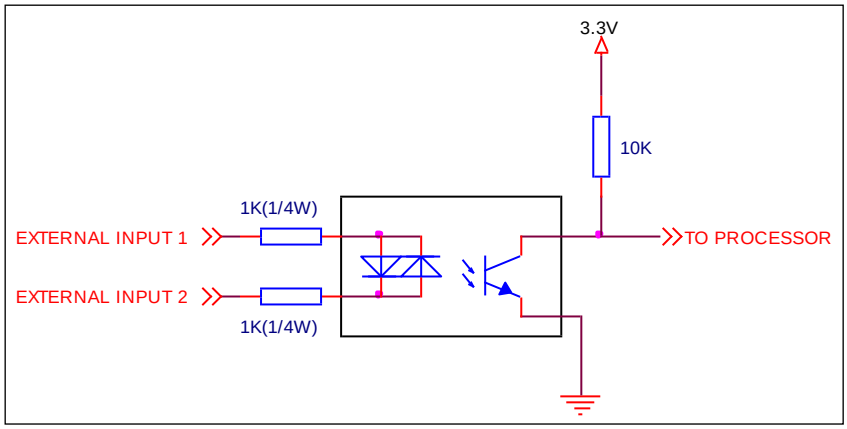

Figure 1-7 a circuit of the input port

The voltage specification of the input port is as follows:

Table 1-1 the voltage specification of the input ports

Max. Input Voltage	DC24V		
V_{IH}	Min. 1.8V	H	1
V_{IL}	Max. 1.2V	L	0

The input port is interfaced with a 5mm terminal block. Thus, use a (-) shaped screwdriver to connect it with the user device.

- Types for giving input

  The type of the input ports is the wet contact by photo-couplers. This type needs two wires which have difference of voltage level for making an input signal. However, there is an accessory which changes the input type to dry contact. By using this, accessory, you can give an input signal (ON or HIGH) with switch (relay) interface.

☞ *The input ports are designed only for monitoring signals.*

1.5.2 Output Ports

The output ports of the CIE-H10 are interfaced to relays as shown below. The [EXTERNAL OUTPUT1] and [EXTERNAL OUTPUT2] port should be interfaced with the user device.

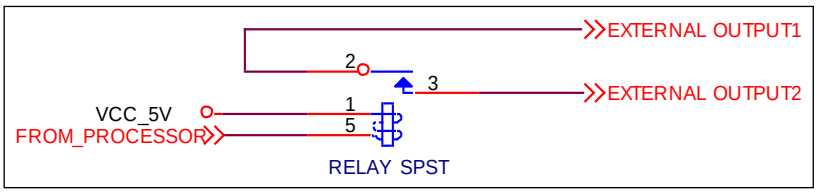

Figure 1-8 a circuit of the output port

The output port operates are as in the following

Table 1-2 values of the output port

value	relay contact
0	OFF (open)
1	ON (short)

The allowed output ports' electrical current of voltage conditions are as in the following:

Table 1-3 voltage conditions of the output port

Voltage Condition	Allowed current
DC28V	5A

The output ports are interfaced with a 5mm terminal block, use a (-) shaped screwdriver to connect it with users' devices.

1.5.3 RS232 Port (DB9M)

The CIE-H10 has an RS232 port supporting from 300 bps to 230,400 bps. This port is for connecting users' serial devices to Ethernet (TCP/IP) including the "Serialized Modbus/TCP".

- Pin Assignment

Table 1-4 pin assignment of the RS232 port

No.	name	description	level	Dir.	Etc.
1	DCD	Data Carrier Detect	RS232	Input	NC
2	RXD	Receive Data	RS232	Input	required
3	TXD	Transmit Data	RS232	Output	required
4	DTR	Data Terminal Ready	RS232	Output	option
5	GND	Ground	Ground	-	required
6	DSR	Data Set Ready	RS232	Input	option
7	RTS	Request To Send	RS232	Output	option
8	CTS	Clear To Send	RS232	Input	option
9	RI	Ring Indicator	RS232	Input	NC

☞ *NC: Not Connected*

- Data bits, Parity, and Stop bit

Table 1-5 parameters of the RS232 port

items	available values
Data bits	8, 7, 6, 5
Parity	None, Even, Odd, Mark, Space
Stop bit	1, 1.5, 2

- Flow Control

  The CIE-H10 supports RTS/CTS and DTR/DSR (Hardware) Flow Control.

- Telnet COM Port Control Option

  The CIE-H10 has Telnet COM Port Control Option function that is specified by RFC2217. It plays a role of an access server. If the Telnet COM Port Control Option is enabled, the CIE-H10 sends the CTS, DSR control signal to the communication counterpart, and sets its serial port items (RTS, DTR, Baud rate, data bits, parity, stop bit) after getting information from the communication counterpart.

1.5.4 Ethernet Interface

An RJ45 connector is for the network interface of the CIE-H10. You can use a UTP cable. It automatically senses 10Mbits or 100Mbits Ethernet. It also provides auto MDI/MDIX function that can automatically sense 1:1 cable or cross over cable.

Each Ethernet device has its own hardware address. The hardware address of the CIE-H10 is fixed in the factory before being shipped to the market. (The hardware address is also known as the MAC address)

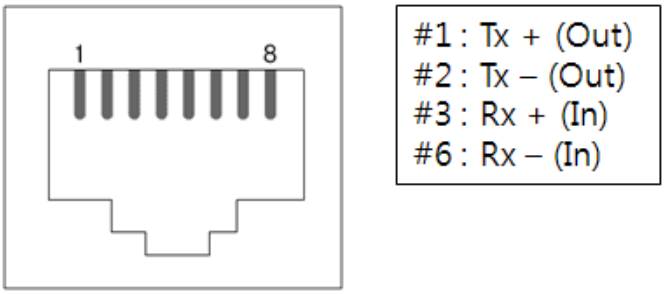

Figure 1-9 the RJ45 connector

1.5.5 Power

DC 5V is used for the power. The specification of the power jack is as following:

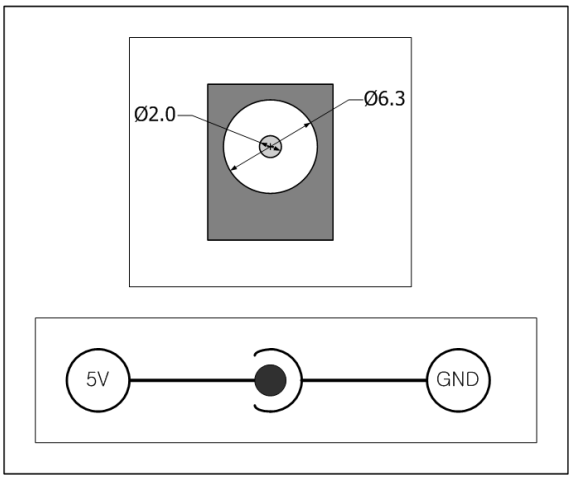

Figure 1-10 the power specification

1.5.6 System LED

The CIE-H10 has 21 lamps to show the current system status.

Each lamp shows the following status:

Table 1-6 status of the system LED

mode	name	color	LED status	description
Common	PWR	Red	On	supplying the power
	LINK	Green	On	connected with 100M bit network
		Red	On	connected with 10M bit network
	RXD	Yellow	blinks	receiving data from the Ethernet
	TXD	Green	blinks	transferring data to the Ethernet
Normal mode	STS	Yellow	blinks every second	assigned an IP address
			blinks 4 times at once	without being assigned an IP address by DHCP or PPPoE
			On	establishing a Modbus/TCP connection
	DI	Yellow	On	when input ports' signal is ON
	DO	Green	On	when output ports' signal is ON
Serial Configuration mode	LINK, STS, RXD, TXD	-	blinks simultaneously	operating for the serial configuration mode
ISP mode	STS	Yellow	Off	operating for the ISP mode

1.5.7 ISP Switch

There is an ISP switch located on the side of the product. It is a switch that will allow the CIE-H10 to be operated as serial configuration mode or ISP mode. If the switch is pressed between 20ms and 1s, the CIE-H10 changes the mode into the serial configuration mode. In this mode, you can configure the environment parameters through the RS232 port. If the button is pressed over a second or the power is supplied when you are pressing the button, the CIE-H10 is operated as ISP mode.

Figure 1-11 ISP switch

☞ *In the ISP and Serial Configuration mode, the designed password and access restriction could be restored or reset. Use these modes when you are faced with the problems.*

2 Installation and Test

2.1 Installation

Let's look into the operation of the CIE-H10. Basically, the set of input ports and output ports are independently used. Thus, you can use the input ports only or the output ports only. On the other hand, you can also correlatively use those ports by using the MACRO mode on the output ports.

Before testing the CIE-H10, you should connect the Ethernet port to a PC. It will be no problem that the Ethernet connection is established through network hubs.

Figure 2-1 the connection between H10 and a PC

2.1.1 Setting Network Aera

This step is for setting both the CIE-H10 and your PC to be located the same network. If only they are, the TCP connection between them can be established.

- Setting of the PC

  Add or change the IP address of the network adapter on your PC.

  Get into the menu of [Windows Control Panel] >> [Network Connections] >> [Properties of the Network Adapter – with right click of your mouse]. Then, you can show the properties of [Internet Protocol (TCP/IP)]. Press the [Advanced..] button and add an IP Address like the figure below.

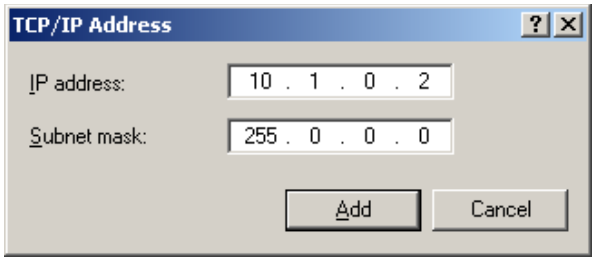

Figure 2-2 adding / changing an IP address

- Setting of the CIE-H10

  ezManager is the management tool for parameters of the CIE-H10. This application is only for MS Windows and this is comfortable to use because it doesn't need installation process.

  First, search your CIE-H10 via network. All the values of parameters are set to the default values in the factory. To apply it to your system, proper values should be set via ezManager.

  Default values of some major parameters are listed on the table below. To do the following simple test, keep these values without any changes.

Table 2-1 default values of some major parameters

parameter		value
Network	Local IP Address	10.1.0.1
	Subnet Mask	255.0.0.0
Option	Telnet	Checked
	IP Address Search	Checked
Serial Port	Serial Type	RS232
	Baud Rate	19,200bps
	Parity	NONE
	Data Bits	8
	Stop Bit	1
	Flow	NONE
	Communication Mode	T2S – TCP Server
	Local Port	1470
I/O Port	Web (HTTP)	Checked
	Web (HTTP) Port	80
	Modbus/TCP	Checked
	Master/Slave	Slave
	Connection Mode	Passive Connection
	Multiple Connection	1
	Peer Port	502

☞ *You can download the latest version of ezManager on the [Download] >> [Utility] page on our website.*

2.2 Test operation

2.2.1 Modbus/TCP Test

This is for checking the operation of Input and output ports of the CIE-H10 via Modbus/TCP. In this instruction, offered Modbus/TCP test program was used.

Run ezManager. Then, you can show the window like the figure below.

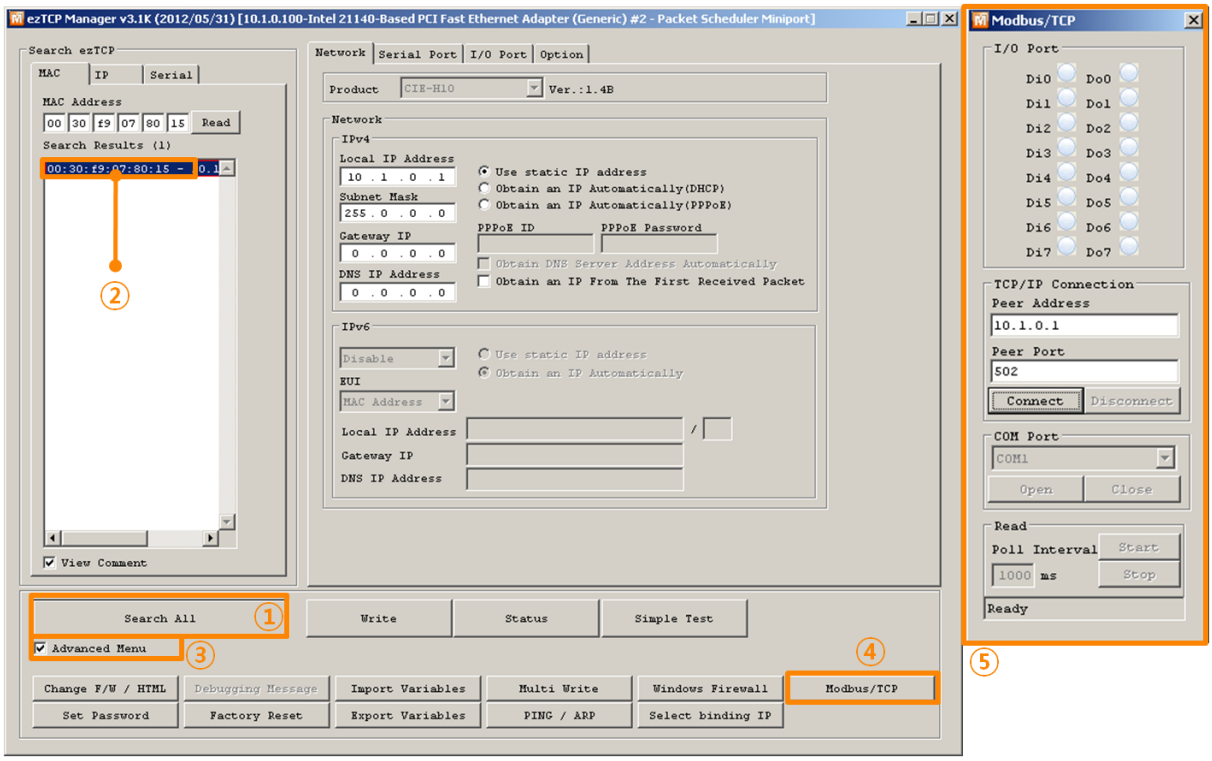

Figure 2-3 Modbus/TCP test program of the ezManager

① Search connected the CIE-H10 with [Search All] button.

② Select a MAC address of searched product on the [search result].

③ Check the [Advanced Menu] option.

④ Press the [Modbus/TCP] button.

⑤ The test program will appear on the right side of the ezManager

☞ *In the case of using previous versions of firmware than 3.1F the test program is shown automatically when you success in searching the product.*

- Modbus/TCP test

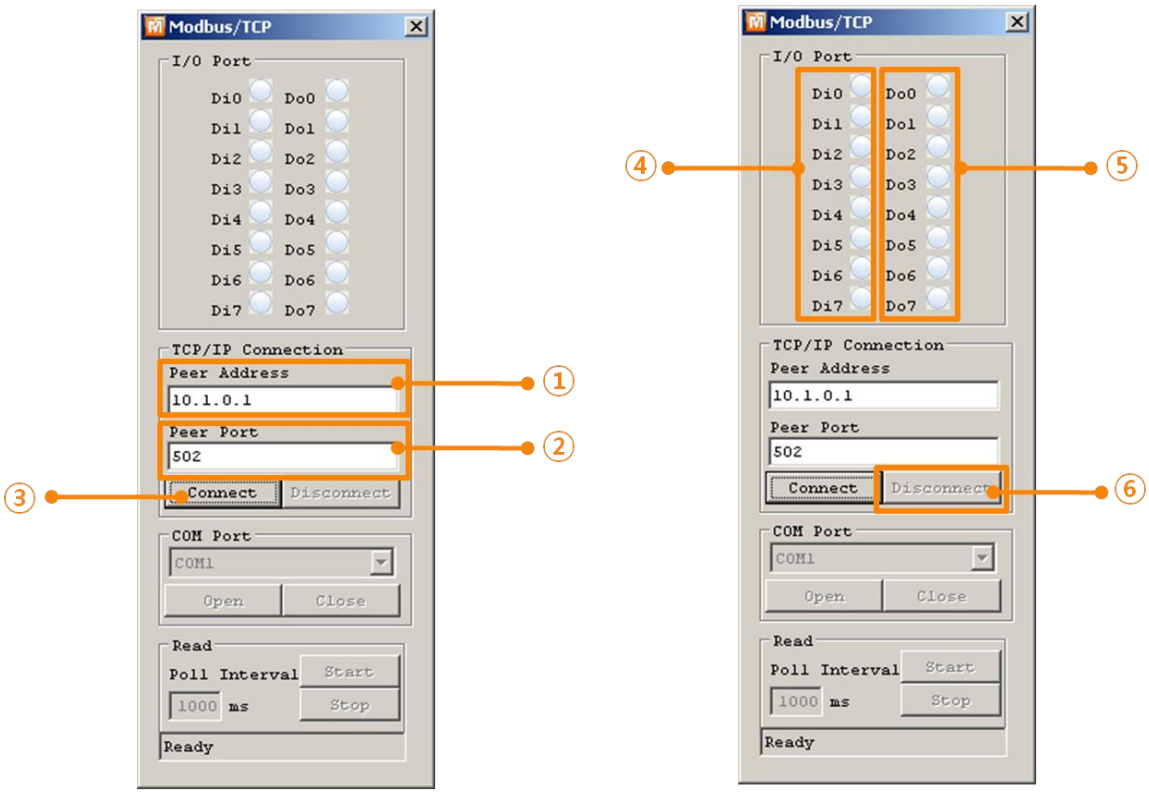

Figure 2-4 Modbus/TCP test

① Input the IP address of the CIE-H10

② Input the local port for Modbus/TCP of the CIE-H10

☞ *In a local area network, ① and ② steps can be omitted.*

③ Try to connect by pressing [Connect] button

④ Under the connection, check if the Di LEDs are turned on or off with signal input

⑤ Check if Do LEDs are turned on or off with clicking the LEDs

⑥ Click the [Disconnect] button after the test is completed

2.2.2 HTTP Test with a WEB browser

This is for testing the operation of Input and output ports of the CIE-H10 via HTTP. The test was implemented with a WEB browser. You can use WEB browsers such as MS Internet Explorer, Google Chrome and Mozilla Firefox.

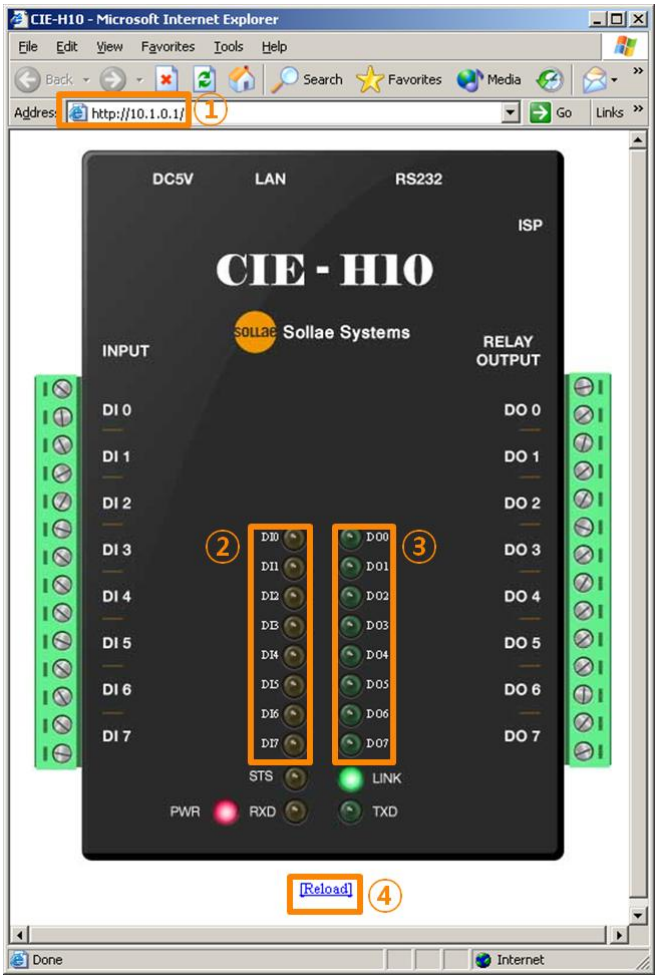

Figure 2-5 HTTP test

① Input the IP address of your CIE-H10 on the address field (Ex: 10.1.0.1).

② Check if the DI LEDs are turned on or off with HIGH signal.

③ Check if DO LEDs are turned on or off with clicking the each of LEDs.

④ Press the [Reload] button to update the status.

3 Configuration

3.1 Configuration with ezManager

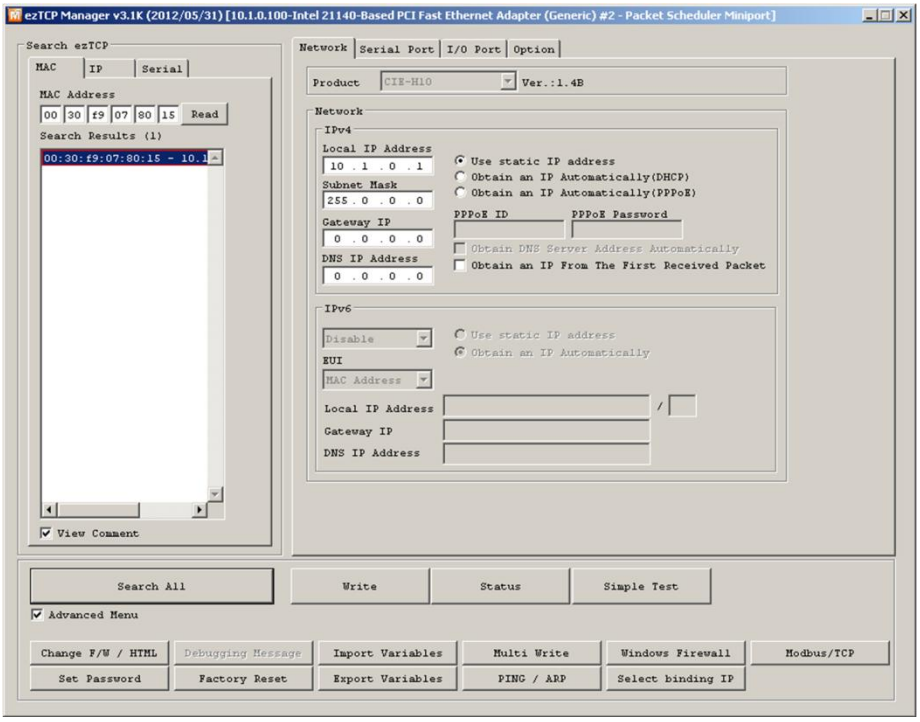

Figure 3-1 initial appearance of ezManager

3.1.1 Configuration via LAN

- Checklists

  Make sure of the connection between your PC and the CIE-H10 via Ethernet. If they are in the same network, [MAC Address search] button can be used. If they aren't, only [IP Address search] is allowed to use.

- Procedures

1. Searching	Use [Search All] or [Read] button on ezManager.
2. Selecting	Select the MAC Address of your product.
3. Setting	Set the values of the parameters.
4. Writing	Store the setting with the [Write] button.

Figure 3-2 procedures for configuration via LAN

3.1.2 Configuration via Serial

- Checklists

  Make sure of the connection between your PC and the CIE-H10 using a RS232 cross cable. The CIE-H10 has to be operating in the [Serial Configuration] mode. You make the CIE-H10 operates in the serial configuration mode by pressing the ISP- button less than 1 second. After then, read the setting on the [Serial] tab.

- Procedures

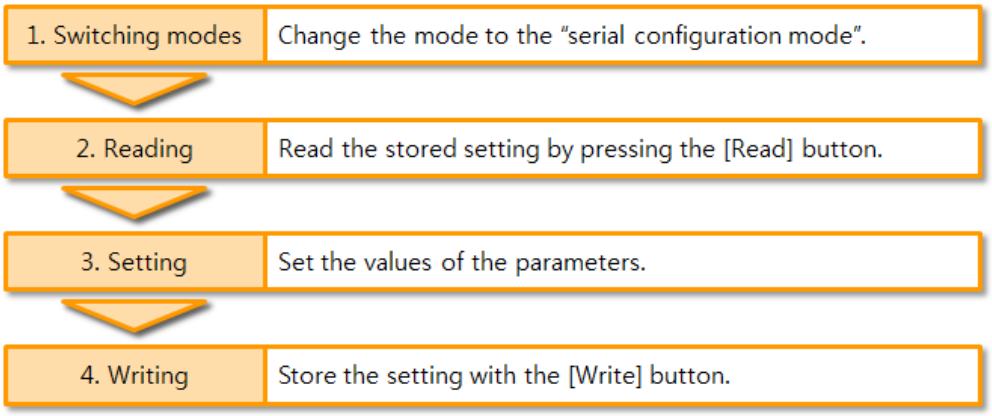
1. Switching modes
Change the mode to the "serial configuration mode".
2. Reading
Read the stored setting by pressing the [Read] button.
3. Setting
Set the values of the parameters.
4. Writing
Store the setting with the [Write] button.

Figure 3-3 procedures for configuration via serial port

- Step 2, Reading

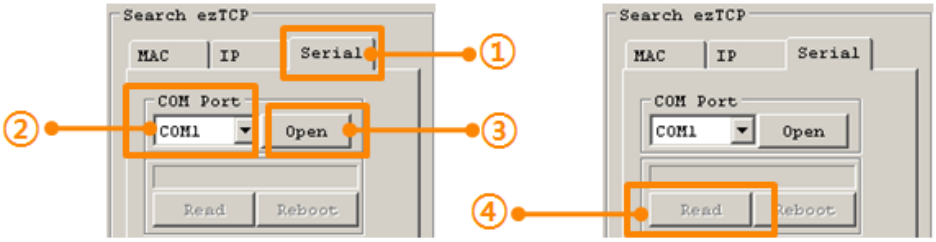

Figure 3-4 reading procedure via serial

① Choose the [Serial] tab.

② Select the COM port which is the device is connected.

③ Open the COM port pressing the [Open] button.

④ Load the setting with the [Read] button.

☞ *If you want to know more specific manners of setting, please refer to the document "ezManager Users' Manual" on the [Download] >> [Technical Documents] page of our website.*

3.2 AT command

In the AT command mode, you can change some parameters through the serial port.

- Checklists

  Make sure of the connection between your PC and the CIE-H10 using a RS232 cross cable. All the parameters of the serial port between the CIE-H10 and the Terminal of your PC should be the same. In the AT command mode, you can change some parameters through the serial port.

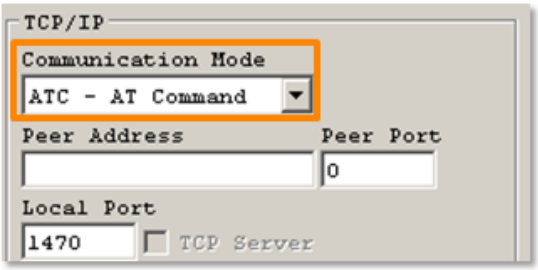

Figure 3-5 setting the communication mode to the AT command

- Procedures

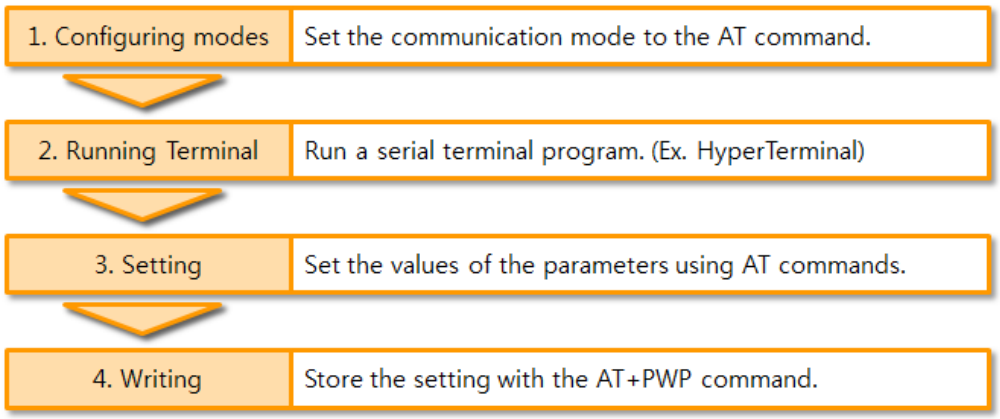
1. Configuring modes
Set the communication mode to the AT command.
2. Running Terminal
Run a serial terminal program. (Ex. HyperTerminal)
3. Setting
Set the values of the parameters using AT commands.
4. Writing
Store the setting with the AT+PWP command.

Figure 3-6 procedures for configuration with AT command

Table 3-1 parameters which are available to change with AT command

Division	Available parameters
IP Address related items	Local IP Address, DHCP, PPPoE, Subnet Mask, Gateway IP Address, DNS IP Address, …
A TCP connection related items	Local Port, Peer Address (IP Address or Host name), Peer Port, …
Option	ESC code sending option, timeout, …

☞ *Including above items, rest of parameters can be set by ezManager*

4 Operation Modes

4.1 What is the Operation Mode?

Each of three operation modes are designed for specific purposes, and those are as follows:

- Normal mode
  This mode is for normal data communication and has 5 different communication modes. Configuring parameters is also available in this mode.
- Serial configuration mode
  This mode is for configuring environmental parameters through the RS-232 port.
- ISP mode
  This mode is for upgrading firmware. In addition, you can set environmental parameters even though the security options are activated and you can also reset the security options.

4.2 How to chage the mode to another

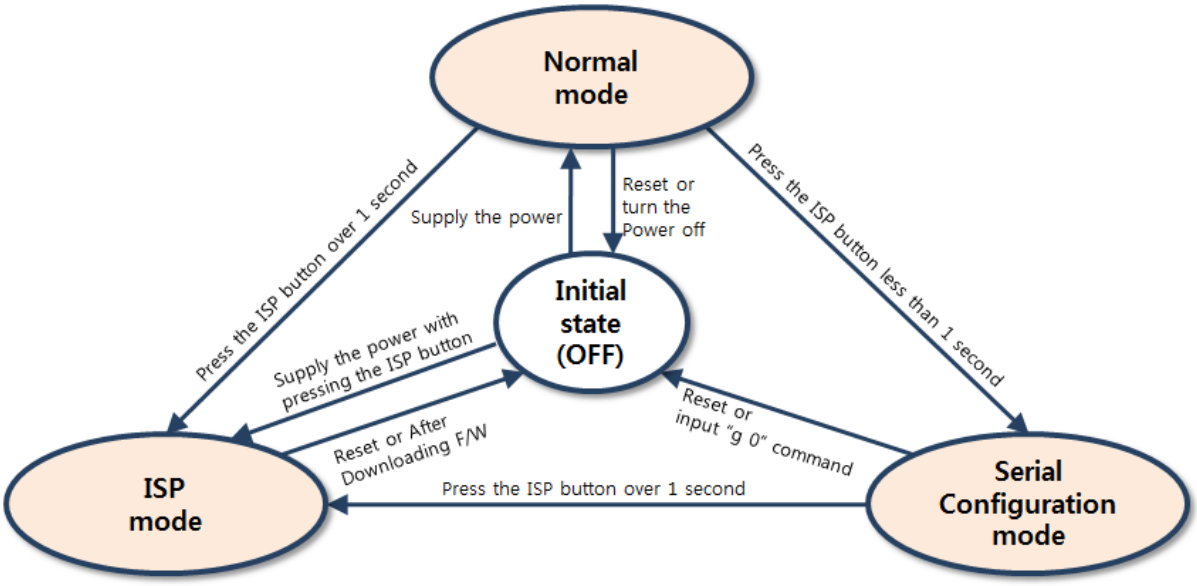
Normal mode
Supply the power
Reset or turn the Power off
Press the ISP button over 1 second
Press the ISP button less than 1 second
Initial state (OFF)
Supply the power with pressing the ISP button
Reset or After Downloading F/W
Reset or input "g 0" command
Press the ISP button over 1 second
ISP mode
Serial Configuration mode

Figure 4-1 how to initiate each operation mode

4.3 Comparison of the each mode

The following table shows summaries of the each mode.

Table 4-1 comparison of the each mode

name	entering	serial port
Normal	Supply the power.	Configured value
Serial Configuration	Press the ISP button shortly between 10ms and 1s.	115200/N/8/1
ISP	Supply the power with pressing the ISP button or press the ISP button over 1 sec in other modes.	115200/N/8/1

4.4 Normal Mode

In normal mode, there are four types of ways to monitor and control I/O and of additional operations as a serial-Ethernet converter.

- I/O controller

Table 4-2 digital I/O control types

type	description
Modbus/TCP	Control and monitor the I/O of the CIE-H10 via Modbus/TCP. It supports both master and slave mode.
Serialized Modbus/TCP	CIE-H10 communicates through the RS232 port using the data format of Modbus/TCP.
Macro	Users can automatically control the output ports by setting MACRO using some basic formula of Boolean Algebra.
WEB(HTTP)	Users can monitor and control the CIE-H10 via HTTP

- serial-Ethernet converter

  The CIE-H10 can be used as a serial-Ethernet converter. There are four communication modes in this operation.

Table 4-3 comparison of four communication modes

name	protocol	connection	modifying software of serial devices	serial configuration	topology
TCP Server	TCP	Passive	-	Not available	1:1
TCP Client		Active	-	Not available	1:1
AT Command		Either	Required	Available	1:1
UDP	UDP	-	-	Not available	N:M

5 Methods for I/O control

5.1 MODBUS/TCP

The CIE-H10 supports Modbus/TCP. By using this protocol, it remotely monitors and controls I/O devices. To use this method, users' application should support this protocol.

5.1.1 Related Parameters

Table 5-1 Modbus/TCP related parameters

parameter	description
Modbus/TCP	Using Modbus/TCP for controlling I/O ports of the CIE-H10.
Slave	The slave responses by queries from the Master
Master	The Master sends queries to the slaves
Poll Interval	the period for sending queries (Unit: ms, Minimum value: 10)
Unit ID	ID for identifying the device or the pair of devices.
Input Port Base Address	Initial address of the input ports
Output Port Base Address	Initial address of the output ports
Passive Connection	waiting for accepting a Modbus/TCP connection
Active Connection	requesting a Modbus/TCP connection
Multiple Connection	The numbers for multiple Modbus/TCP connections.
Control Method of (FC XX)	Control method for the output ports of the slave (Single / Multiple)
Control Method of (AND/OR)	Control method for the output ports of the master (AND / OR)
Peer Address	Peer's IP address when the CIE-H10 performs active connections
Peer Port (Active)	Peer's local port when the CIE-H10 performs active connections
Peer Port (Passive)	Local port
Input Change Notification	A function for immediate notification with changing the IP address.
Macro	Applying macro function on the output port
Initial State	Output port value when the CIE-H10 boots up.

☞ *The difference between the values of [Input port base address] and [Output port base address] should be at least 8.*

5.1.2 Modbus/TCP Slave Mode

According to the standard Modbus/TCP users can use a Modbus/TCP manager to control and monitor their I/O devices. Like this standard, you can set the CIE-H10 to the [Slave] item to [Slave] mode. The [Passive] connection would be better than the [Active] in this mode and the [Peer Port] should be 502.

Table 5-2 values for standard Modbus/TCP

Modbus/TCP Mode	Slave
TCP Connection	Passive
TCP Port	502

Configure the proper values of [Unit ID], [Input Port Base Address], and [Output Port Base Address].

5.1.3 Modbus/TCP Master Mode

In this mode, the CIE-H10 operates as a Modbus/TCP master. As a master the CIE-H10 sends queries which read the values of the input ports and which change the values of the output ports to the Modbus/TCP slave devices. At this time, the CIE-H10 controls the output ports with not only bit unit (individually) but also word unit (at once)

- FC 16(Multiple)
  CIE-H10 controls the output ports and monitors the input ports of slaves with WORD unit by FC16 (write multiple register) and FC 03 (read multiple register)
- FC 05(Single)
  CIE-H10 controls the output ports and monitors the input ports of slaves with BIT unit by FC05 (write coil) and FC02 (read input discretes).

5.1.4 TCP Connection Modes

In the standard of Modbus TCP, the master program should make a connection to the slave using port number 502. However, sometimes Modbus/TCP devices should try connecting to the master actively. For this case, the CIE-H10 supports the active connection mode.

Table 5-3 the passive / active connection

The passive connection	- standard Modbus/TCP - Remote host connects to the CIE-H10. - Port number that is used for communication must be designated
The active connection	- The CIE-H10 tries to establish a connection to the remote host - The IP address (or host name) and port number of the remote host is required

5.1.5 Initial Output Value

The initial value of the CIE-H10's output port can be configured. Depending on the value of [Initial State] at the boot time, output ports are set to ON or OFF.

5.1.6 Write Pulse

By using the function code 105, you can give the signal of pulse type to the output ports. This means the output signal is kept during specified time configured by users.

☞ *For more details about the Modbus/TCP protocol, please refer to the document on the [Download] >> [Technical Documents] page of our web site.*

5.2 Serialized Modbus/TCP

Since 1.3A firmware, serialized Modbus/TCP mode had been added on the firmware. In this mode, the CIE-H10 sends and receives Modbus/TCP data via the serial port. By using this mode, you can monitor and control the I/O ports of the CIE-H10 through the RS232 port.

Note that if you are using this mode, you can't control the output ports of the CIE-H10 with HTTP or Modbus/TCP. And also, the TCP and UDP data communication for serial devices cannot be activated.

5.3 Macro Mode

This mode let users set the values of the output ports with simple macros. The CIE-H10 reflects the values according to the macro expressions which are configured by users in advance. It will be useful when users set the output values automatically from combinations of inputs. Check [Macro] options on ezManager to activate this mode.

5.3.1 Operator

The algorithm used in the Macro mode is Boolean algebra. In this case, the AND, OR, NOT are used as operators. Parenthesis may also be used.

The priority of operators is in the following order: parenthesis > NOT > AND > OR.

Each operator is represented by the following symbols.

Table 5-4 the operators

name	sign	description
Parenthesis	( )	Since calculations within the parenthesis have the highest priority, they will be calculated first. Parenthesis may be nested used.
NOT	/	Operand that follows NOT operator is toggled. (If operand is 0, it will be changed to 1. If it is 1, it will be changed to 0.)
AND	*	If Operand values that surrounds AND operator all 1, the result value will be 1. If either one of them is 0, the result will be 0 as well.
OR	+	If Operand values that surrounds AND operator all 0, the result value will be 0. If either one of them is 1, the result will be 1

5.3.2 Operand

Operands used in macro mode are each input port. Each input port is designated with i0 ~ i7 symbol based on their sequence. Since capital letters are not recognized, they can also be written as I0 ~I7.

☞ *The output ports couldn't be used as an operand.*

5.3.3 Expression example

Here are some examples. In the expressions, spaces between the two operands will be ignored.

Table 5-5 an example of equation

Do0	i0 + i1	Perform OR for i0 and i1. Spaces in between two operands may be ignored
Do2	i0 * /(i1 + i7)	Perform NOT with value from performing OR for i1 and i7. Then, perform AND with that value and i0

Based on input values from three input ports, the output values are as follows.

Table 5-6 the logic table of the table 5-5

Input port value			Output port value	
i0	i1	i7	Do0	Do2
0	0	0	0	0
0	0	1	0	0
0	1	0	1	0
0	1	1	1	0
1	0	0	1	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	0

5.4 Web (HTTP)

After starting the web browser, type the CIE-H10's IP address after typing http:// in the address window to connect to the CIE-H10.

If passwords for the CIE-H10 are designated, the following window will be popped up.

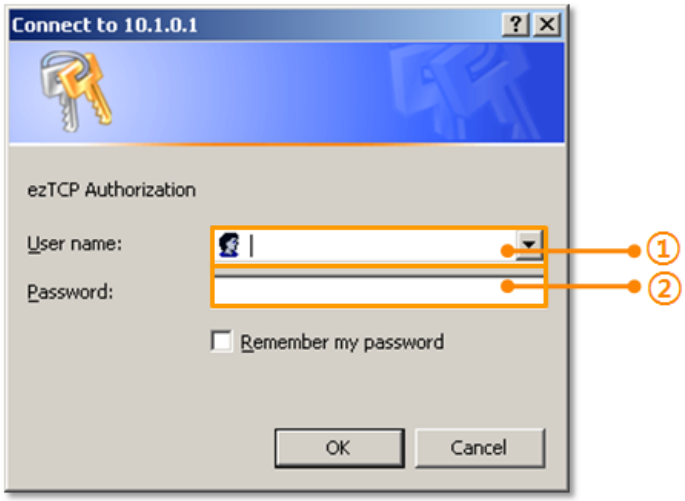

Figure 5-1 authentication with password

① the CIE-H10 does not care the [User name]. (You don't have to fill the box)

② [Password] should be the same with password which is set through the ezManager.

5.4.1 Changing port number for HTTP

In case you cannot use the port number 80(default port number for HTTP) because the ISP (Internet Service Provider) blocks the port, you can change that port number.

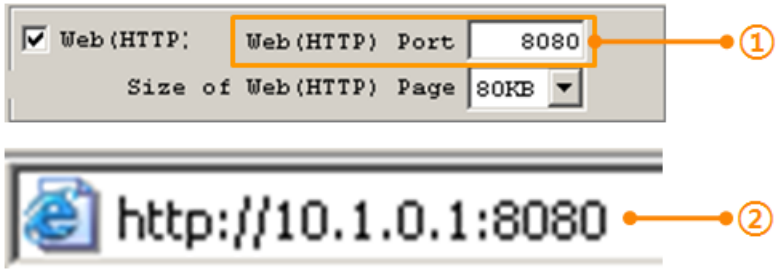

Figure 5-2 changing port number for HTTP

① Input a port number to the [Web(HTTP) Port] box.

② Input the IP address of the CIE-H10 with changed port number and "http://"

5.4.2 Uploading Users' Web Page

1.3A or subsequent versions of firmware support uploading custom web page. This function is available to anyone who can make HTML files. If you get some simple syntax, it is possible to monitor and control the I/O ports with your homepage interface.

- Upgrading Boot and Firmware

  To use this function, it is needed for users who have been using 1.5 version of boot and 1.2C version of firmware or lower versions. If you have already got the updated products, you don't need this process.

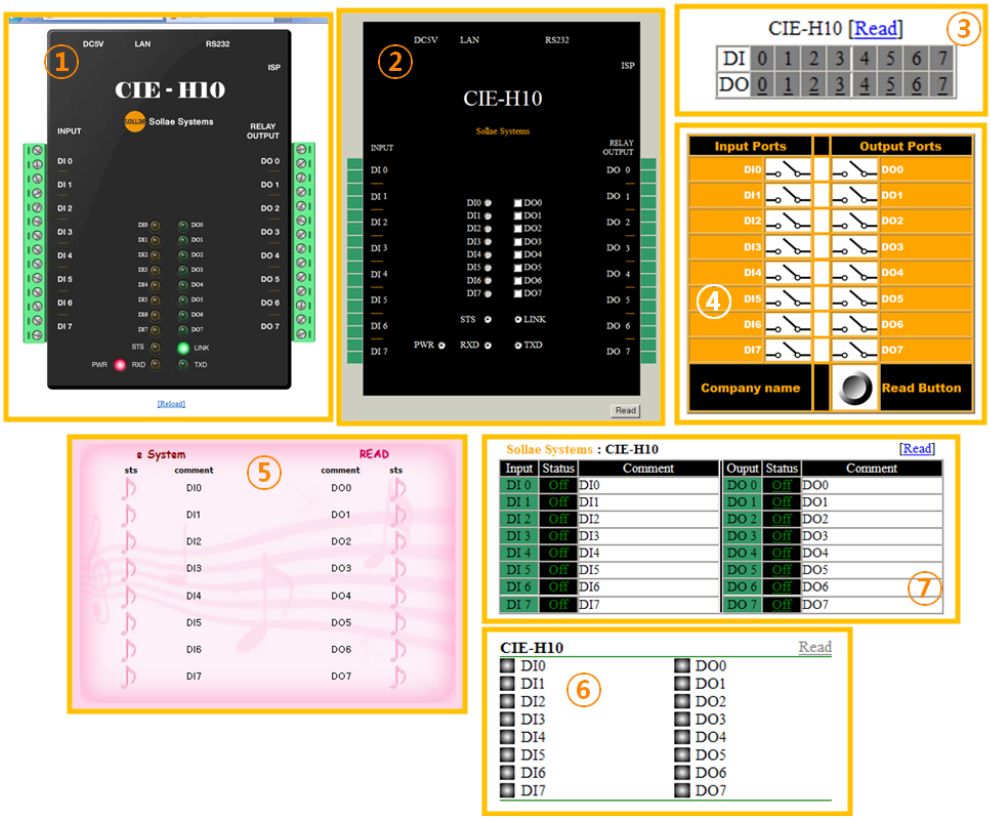

Figure 5-3 examples of web page

① Default image
② Default text
③ No comment
④ Sample01
⑤ Sample02
⑥ Simple image
⑦ Simple text

☞ *If you cannot use this function, you should upgrade the version of boot even though your CIE-H10 has the latest version of F/W. For more information about the upgrading boot, please refer to the "CIE-H10_upgrading Boot and F/W" document on the [Download] >> [Technical Documents] page.*

6 Communication Modes

The CIE-H10 provides RS232↔TCP/IP conversion function along with input/output port monitoring and controlling function.

6.1 TCP Server

In this mode, the CIE-H10 functions as a TCP server. The CIE-H10 waits for a TCP connection from remote hosts. Once a host tries to connect to the CIE-H10, it responses to that request. After the connection is established, the CIE-H10 converts the raw data from the serial port to TCP/IP packets and sends the packets to the network and vice versa.

6.1.1 Key parameters

- Local Port
  This is a server's port number which is used in the TCP connection.
- Event Byte
  With setting event bytes, users can handle the serial data before a TCP connection is established.

Table 6-1 Event Byte

Value	Description
0	CIE-H10 doesn't send the data
Otherwise (512 or under)	CIE-H10 sends the data right after a connection is established. 512 or under bytes are strongly recommended.

- Timeout
  If there is no transmission of data for amount of time which is set to this parameter, the CIE-H10 tries to terminate established a TCP connection.
- Notify IP Change
  This function is for notifying information about changed IP address to a server. Not only the TCP/UDP protocol but Dynamic Domain Name Service (DDNS) can be used.
- Restriction of Access(ezTCP Firewall)
  Users can block TCP connections from unauthorized hosts by using this option. Both IP and MAC address are available.

6.1.2 An Example

- An example as a TCP server

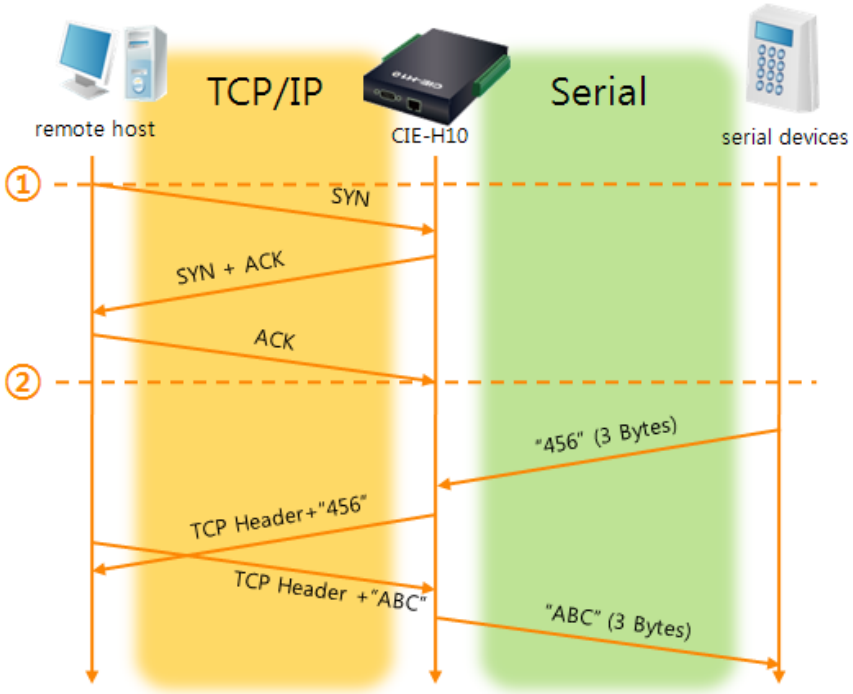

Figure 6-1 TCP server

Table 6-2 descriptions of each state

Point	State
~	H10 is waiting for request segments of a TCP connection
①	Remote host has sent a request (SYN) segment
~	Processes of the connection
②	The connection has been established
~	Data communication on both sides

6.2 TCP Client

In this mode, the CIE-H10 functions as a TCP client. The CIE-H10 sends request segments to a remote host with information of [Peer Address] and [Peer Port]. Under situation that the TCP server works fine with the specific port, the connection will be established. After then, the CIE-H10 converts the raw data from the serial port to TCP/IP data and sends them to the network and vice versa.

6.2.1 Key parameters

- Peer Address

  This item should be an address of a remote host who is waiting requests of a TCP connection.

- Peer Port

  [Peer Port] should be the port number which is designated by the remote host.

- Event Byte

  The CIE-H10 decides the time to send request segments for the TCP connection with this parameter.

Table 6-3 the operation of Event Byte 1

Value	Description
0	CIE-H10 sends a request segment of the TCP connection right after it boots up
Otherwise (512 or under)	CIE-H10 sends the segment right after it received amount of data which is set to the [Event Byte] from the serial port

In addition, users can handle the serial data before a TCP connection is established with this parameter.

Table 6-4 the operation of Event Byte 2

Value	Description
0	CIE-H10 doesn't send the data.
Otherwise (512 or under)	CIE-H10 sends the data right after a connection is established. 512 or under bytes are strongly recommended.

- Timeout

  If there is no transmission of data for amount of time which is set to this parameter, the CIE-H10 tries to terminate the established TCP connection.

- TCP Server

  This check option is enable the TCP server / client mode. In this mode, the CIE-H10 can be operated as a TCP server or client without changing its setting.

- DNS IP Address

  [DNS IP Address] needs when users use host name instead of the IP address on the [Peer Port] parameter.

6.2.2 An Example

- An example of TCP client

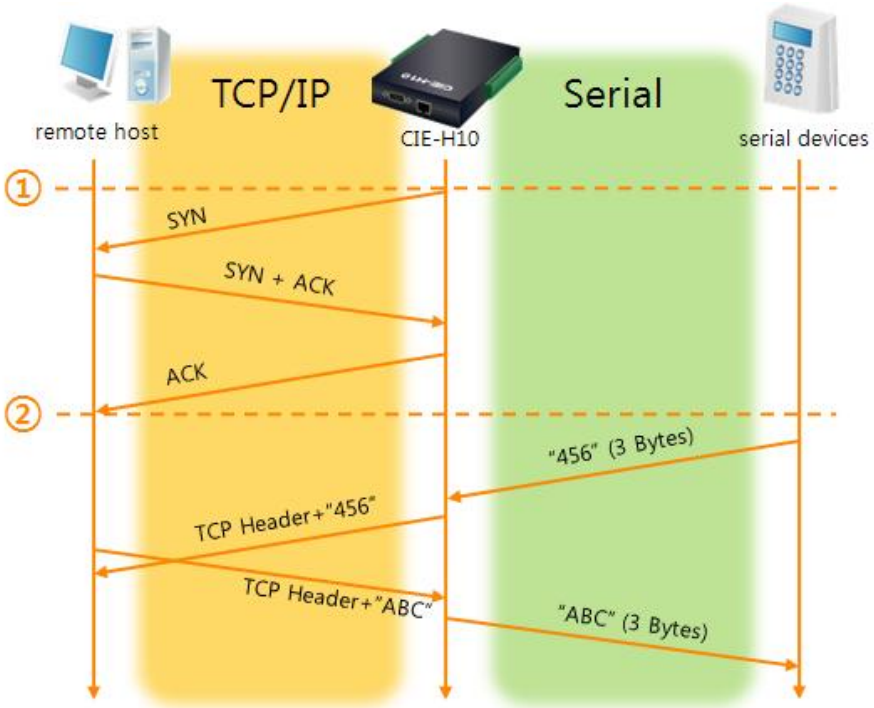

Figure 6-2 time chart for a situation that [Event Byte] is set to 0

Table 6-5 descriptions of each state

Point	State
~	Before the power is supplied
①	Sends request segments of a TCP connection right after it boots up
~	Processes of the disconnection
②	The connection has been established
~	Data communication on both sides

- TCP Server/Client mode

  In the TCP client mode, the [TCP Server] check option is activated. If you check this option, the CIE-H10 operates as the TCP server/client mode. In this mode, the CIE-H10 can establish a TCP connection both actively and passively without changing any setting.

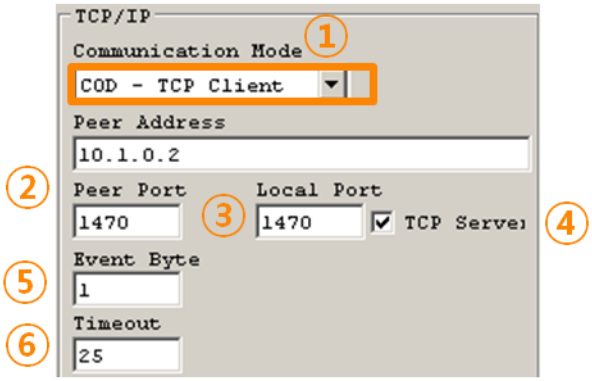

Figure 6-3 setting the TCP server/client mode

① Select the [COD – TCP Client] mode

② Input an IP address and port number of a remote host

③ Check the [TCP Server] check box

④ Input the [Local Port] for waiting for the request segments of a TCP connection

⑤ Set the [Event Byte] to value more than 1 byte

⑥ Set the [Timeout] to proper value

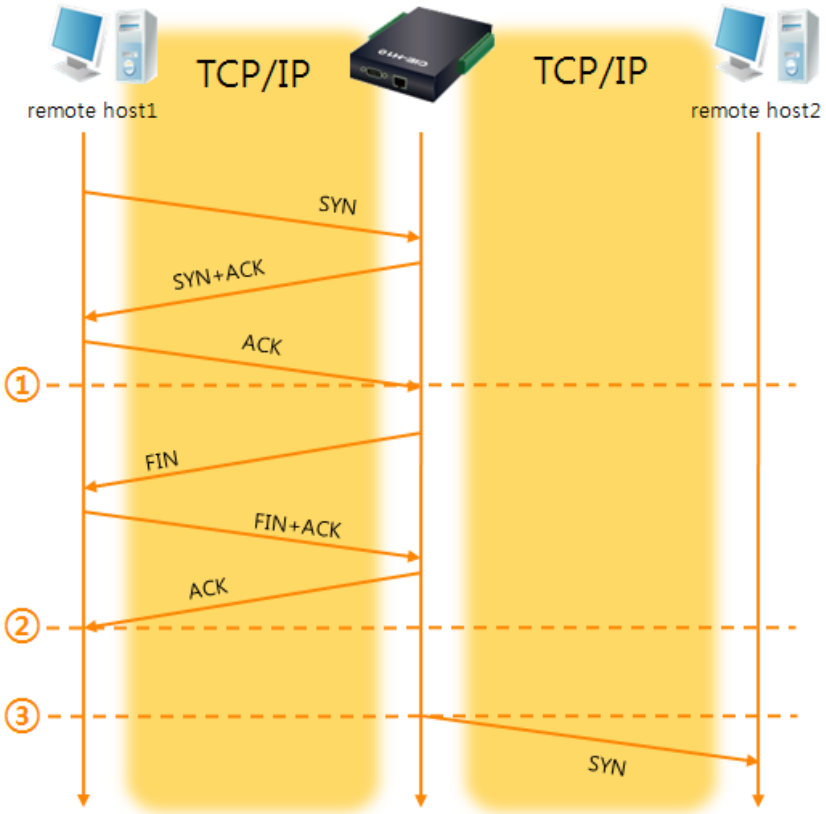

Fig 6-4 time chart for activating [TCP Server] option

Table 6-6 descriptions of each state

Point	State
~	H10 is waiting for request segments of a TCP connection
①	The connection has been established
~	H10 is on line and processes of the disconnection
②	The connection has been terminated
~	Both sides are offline
③	Sends a request segment of a TCP connection

The TCP Server/Client mode only can be a useful option under condition of using [Event Byte] and [Timeout]. Note that only one TCP connection can be established at the same time, so users should consider setting [Timeout] properly.

☞ *For more details about the TCP Server/Client mode, please refer to the technical document on the [Download] >> [Technical Documents] page of our web site.*

6.3 AT Command

AT command is a mode which users control the CIE-H10 with AT command like controlling modem. In this mode, active and passive TCP connections are available. And users are allowed to configure some environmental parameters with extended commands.

6.3.1 Key parameters

The configuration should be implemented via the serial port of H10

Table 6-7 some of extended commands for configuration

Commands	Description	Examples
+PLIP	Local IP Address	AT+PLIP=10.1.0.1<CR>
+PLP	Local Port	AT+PLP=1470<CR>
+PRIP	Peer IP Address	AT+PRIP=10.1.0.2<CR>
+PRP	Peer Port	AT+PRP=1470<CR>
+PDC	DHCP	AT+PDC=1 (ON)<CR>
+PTO	Timeout	AT+PTO=10<CR>
+PWP	Store setting	AT+PWP<CR>

- Related items with the IP Address and Local Port
  As well as the local port, the IP address related parameters such as IP Address, Subnet Mask and Gateway IP Address can be set.
- Peer Address / Peer Port
  IP address and local port of a remote host are can be set.
- Type of assigning the IP address: Manual, DHCP, PPPoE
  Not only manual setting, also automatic assigning protocol (DHCP, PPPoE) is available.
- The others
  Some of options including [Timeout] can be configured in this mode.

6.3.2 Examples

- TCP Server – setting parameters and a passive connection

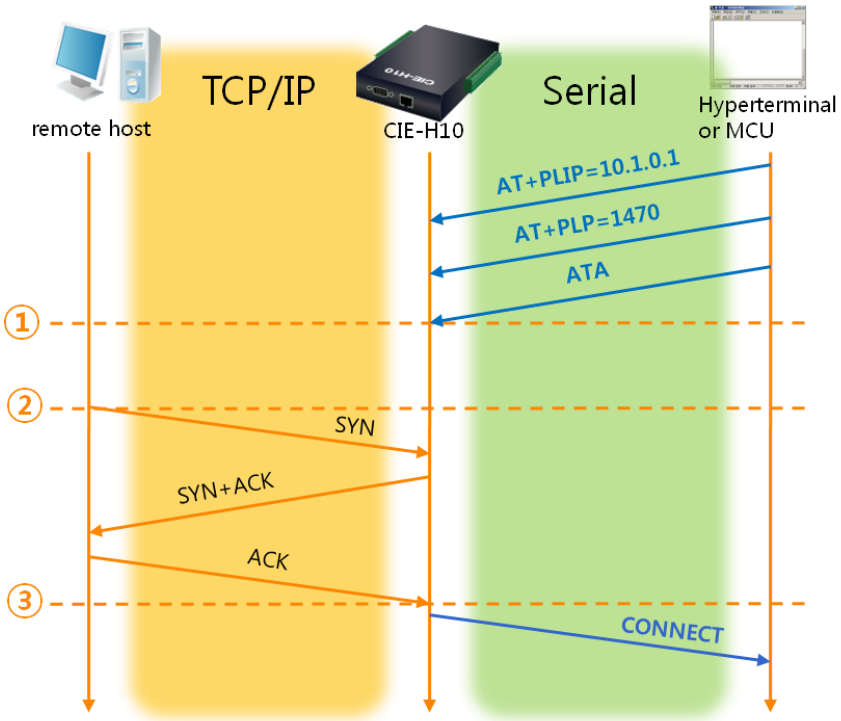

Figure 6-5 a passive TCP connection

Table 6-8 descriptions of each state

Point	State
~	Set parameters in the AT command mode
①	H10 waits request segments of a TCP connection with the ATA command
~	H10 is waiting for requests of a TCP connection
②	A remote host has sent SYN segment to H10
~	Processes of the TCP connection
③	TCP connection has been established
~	The CIE-H10 sends "CONNECT" message to the serial port

☞ *Most of the response messages from the serial port of the CIE-H10 are omitted on above figure.*

- TCP Client – setting parameters and an active connection

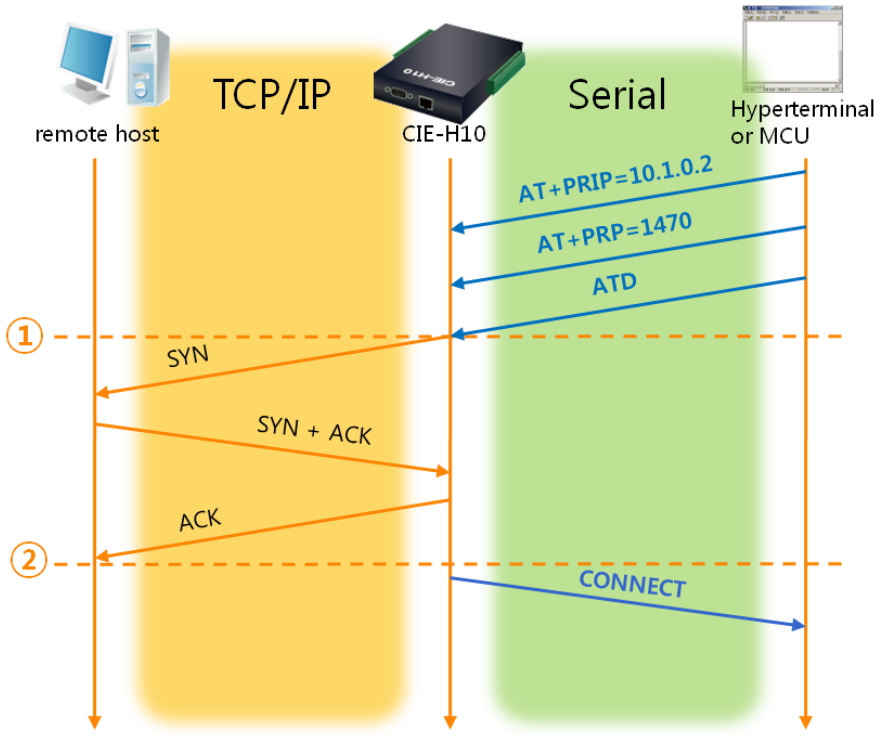

Figure 6-6 an active TCP connection

Table 6-9 descriptions of each state

Point	State
~	Set parameters in the AT command mode
①	H10 sends a request segment of a TCP connection with the ATD command.
~	Processes of the TCP connection
②	The TCP connection has been established.
~	The CIE-H10 sends "CONNECT" message to the serial port.

☞ *For more information about this, please refer to the "ATC mode" on the [Download] >> [Technical Documents] menu of our web site.*

6.4 UDP

UDP has no processes of a connection. In this mode, data is sent in block units. Therefore, data that comes through the CIE-H10's serial port must be classified in block units to be sent elsewhere.

6.4.1 Key parameters

- Block Size(Byte)

  [Block Size] means the size of a block in UDP mode. Its unit is byte. The size of bytes are come into the serial port, the CIE-H10 sends them as one block to the network. The maximum value could be 1460 bytes.

- Data Frame Interval

  [Data Frame Interval] means the time for gathering data to make one block. Its unit is 10ms. If there is no transmission during the time which is set to this value, the CIE-H10 sends gathered data in the buffer as one block to the network.

☞ *Once one of the parameters is sufficient, the block size is decided as the condition.*

- Dynamic update of Peer host

  If users set the value of [Peer Address] and [Peer Port] to 0, [dynamic update of peer host] function is activated. By using this function, the CIE-H10 can communicate with multiple hosts without additional setting.

6.4.2 Examples

- Block Size: 5 bytes / Data Frame Interval: 1s (100 * 10ms)

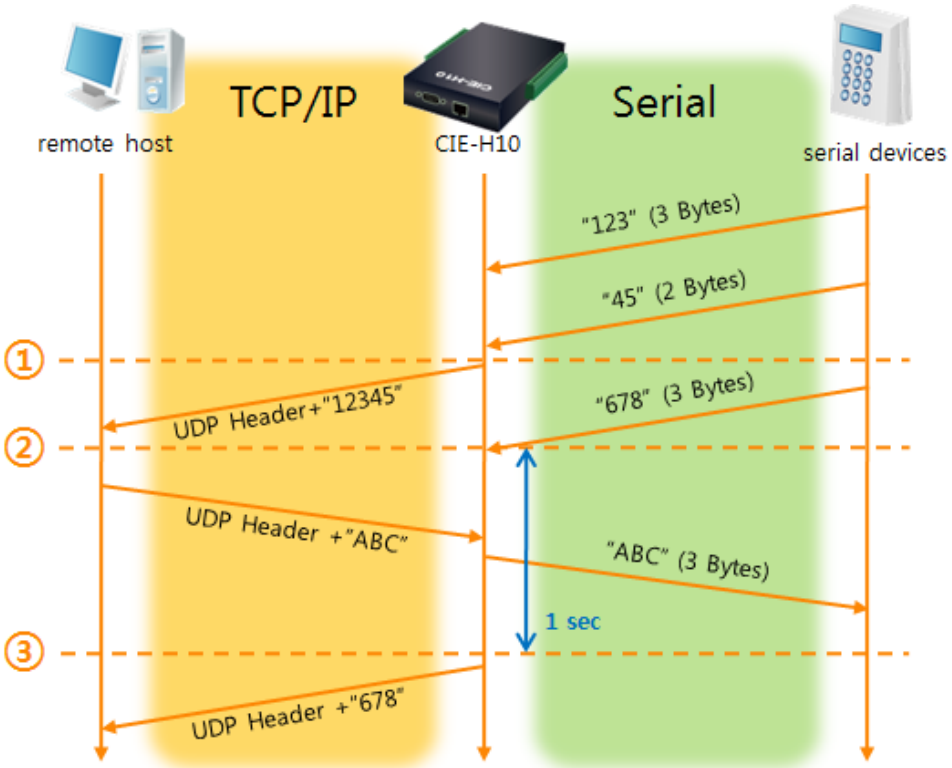

Figure 6-7 time chart for block size is 5 bytes and Data Frame Interval is 1s

Table 6-10 descriptions of each state

Point	State
~	H10 is receiving data from the serial port
①	H10 Sends 5 bytes as one block based on the [Block Size]
~	Serial device sends data "678" to the H10
②	Data "678" has arrived
~	H10 sends data from the remote host to the serial device
③	1 second has passed
~	H10 sends data "678" based on the [Data Frame Interval]

- Dynamic Update of Peer host

  This is a function that the CIE-H10 automatically sets its peer host with information of the last packet which is received from network. In the packet, the source address and port number is used.

Table 6-11 setting for [dynamic update of peer host] function

Parameter	Value
Peer Address	0 (None)
Peer Port	0

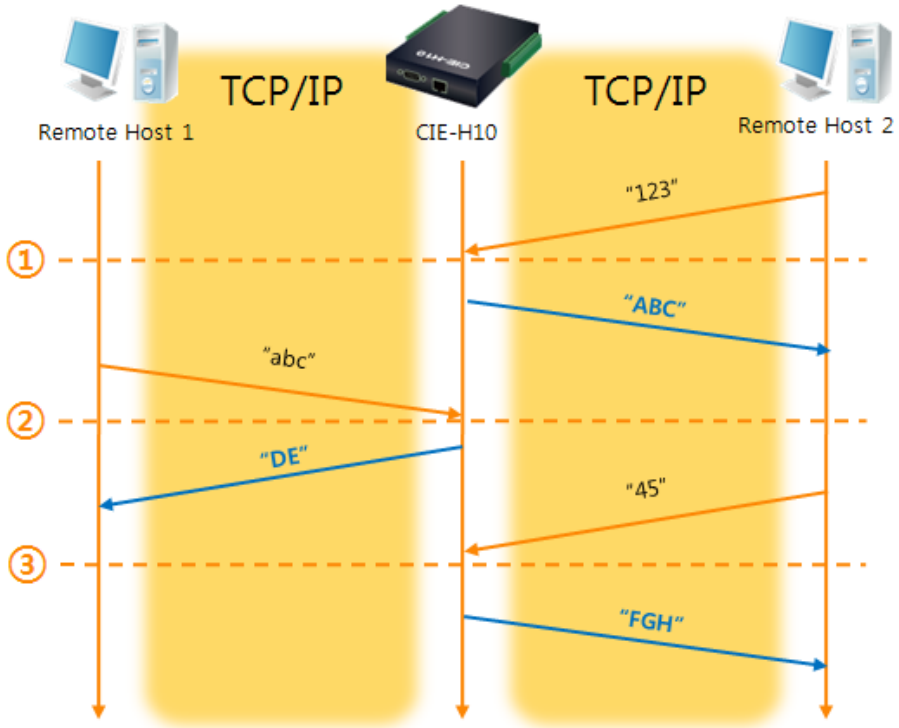

Figure 6-8 Time chart for [dynamic update of peer host]

Table 6-12 descriptions of each state

Point	State
~	Remote host 2 sends data to H10
①	H10 sets host 2 to peer host
~	Remote host 1 sends data to H10
②	H10 updates host 1 to peer host
~	Remote host 2 sends data again to H10
③	H10 updates host 2 to peer host
~	H10 can communicate with remote host 2

☞ *The data "ABC", "DE", "FGH" are from the serial port of the CIE-H10 in the above figure.*

7 System Management

7.1 Upgrading Firmware

7.1.1 Firmware

Firmware is a type of software for operation of the CIE-H10. If there are needs for adding function or fixing bugs, the firmware will be modified and released. We recommend that users keep use the latest released firmware.

7.1.2 Processes

- Downloading the latest released firmware
  Download the newest firmware file. We update our homepage when a new firmware is released. You can find it on our website.
- Entering ISP mode
  Enter ISP mode to download firmware file to the CIE-H10.
- Run a TFTP client and ready to send the F/W file
  Run a TFTP client program. ezManager is equipped the client program. Click the [Change F/W / HTML] button.

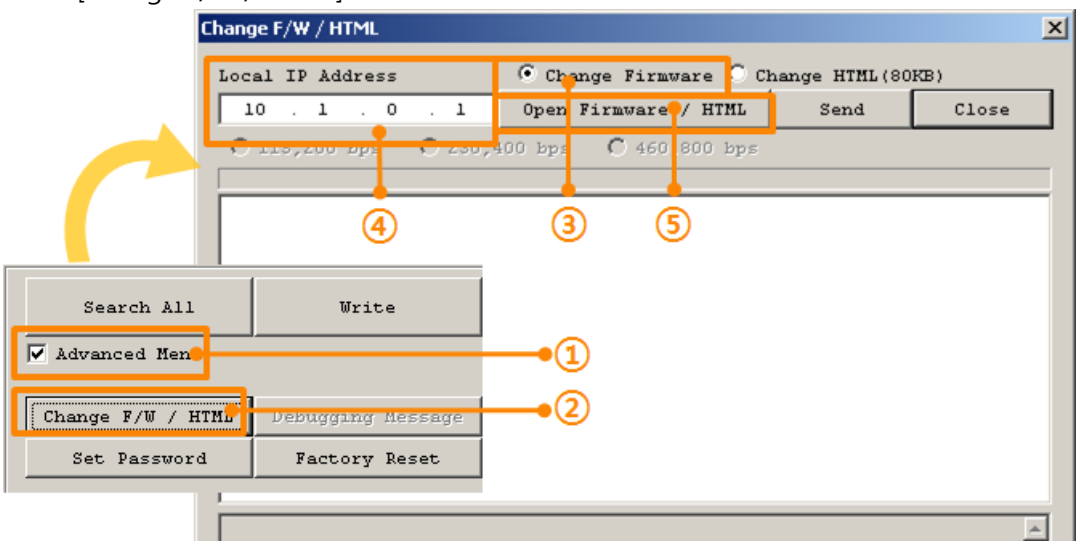

Figure 7-1 running TFTP client

① Check the [Advanced Menu] check box
② Click the [Change F/W / HTML] button to run TFTP client
③ Select the [Change Firmware] radio button
④ Input the IP address of the CIE-H10 to the [Local IP Address] text box
⑤ Press the [Open Firmware / HTML] button and choose the firmware file

- Checking firmware file and Sending

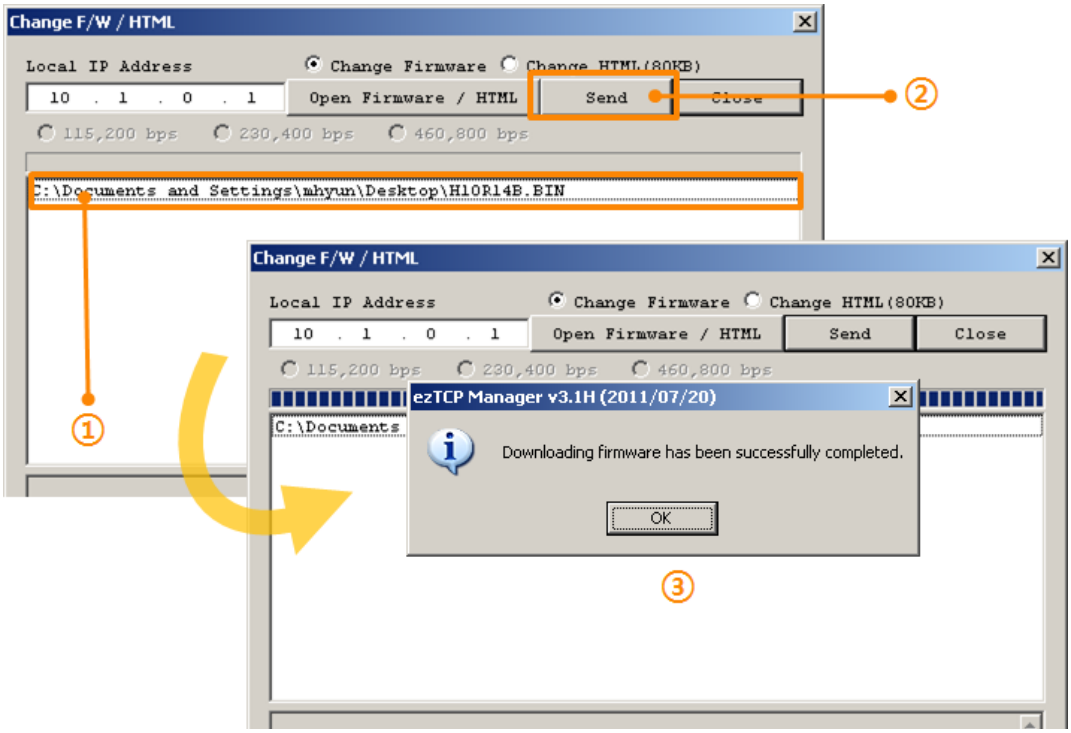

Figure 7-2 sending firmware file

① Check if the name and path of the firmware file are correct

② Click the [Send] button

③ Confirm the completed message

7.2 Changing Webpage

7.2.1 Webpage

To monitor and control, homepage should be uploaded in the CIE-H10.

7.2.2 Processes

- Making Users' webpage or Downloading sample files

  Make your own webpage file or use sample webpage files which we've been offering on our web site.

- Entering ISP mode

  Enter ISP mode to send HTML files to the CIE-H10.

- Running a TFTP client and ready to send the HTML files

  Run a TFTP client program. ezManager is equipped the client program. Click the [Change F/W / HTML] button.

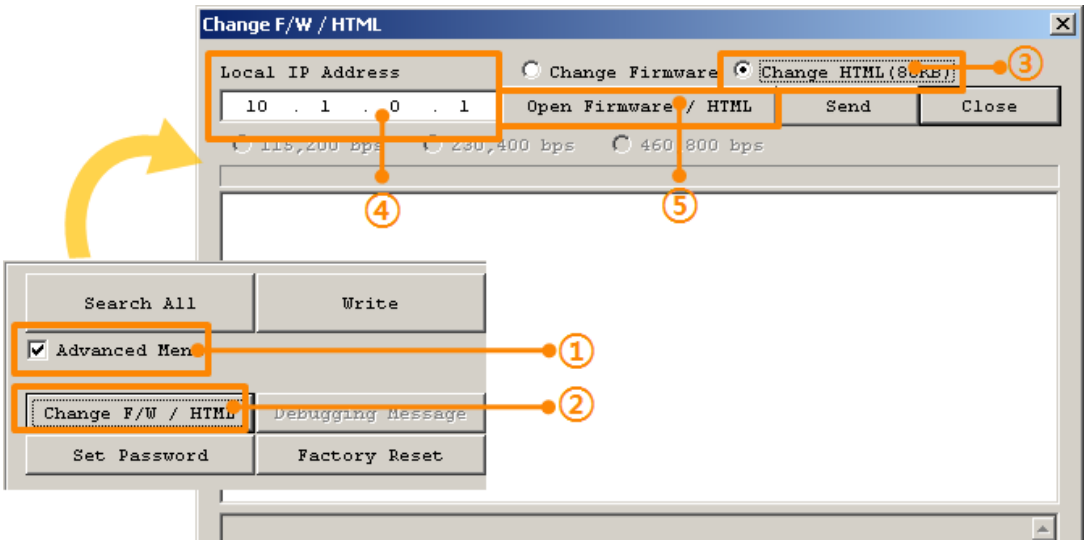

Figure 7-3 running TFTP client

① Check the [Advanced Menu] check box

② Click the [Change F/W / HTML] button to run TFTP client

③ Select the [Change HTML] radio button

④ Input the IP address of the CIE-H10 to the [Local IP Address] text box

⑤ Press the [Open Firmware / HTML] button and choose the HTML file

- Checking firmware file and Sending

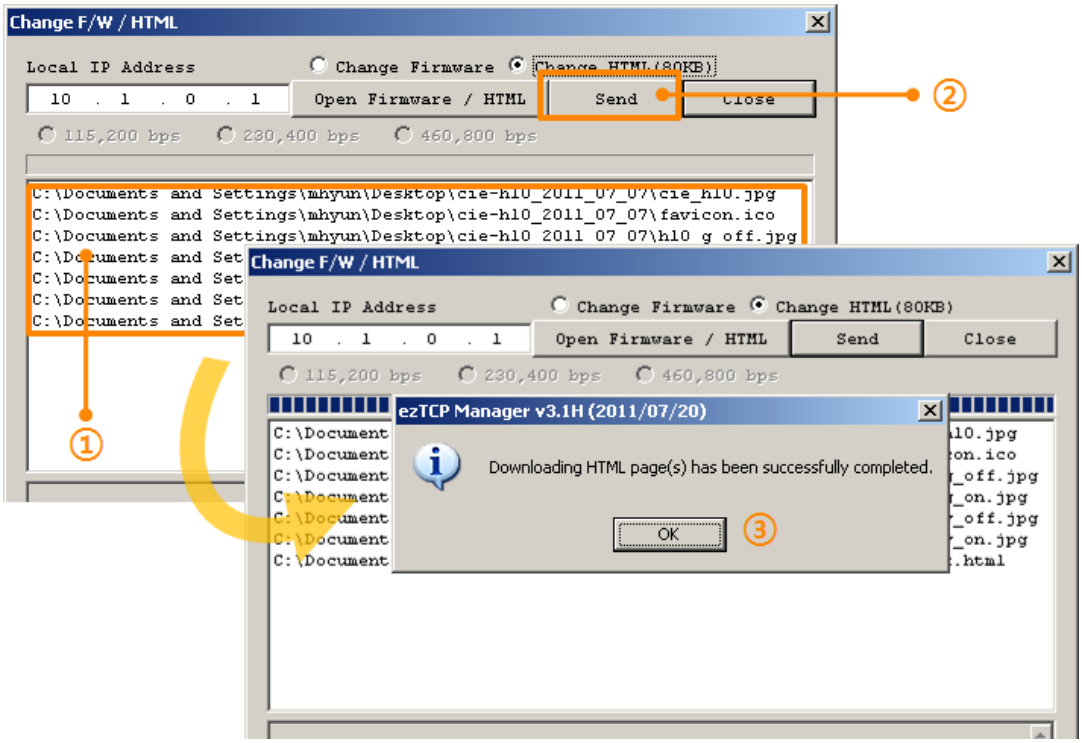

Figure 7-4 sending firmware file

① Check if the name and path of the firmware file are correct

② Click the [Send] button

③ Confirm the completed message

7.3 Status Monitoring

7.3.1 Using TELNET

Once the [TELNET] option is activated, users can remotely log in to the CIE-H10. If a password is set, users should input the password.

After then, messages from the CIE-H10 appear like the figure below.

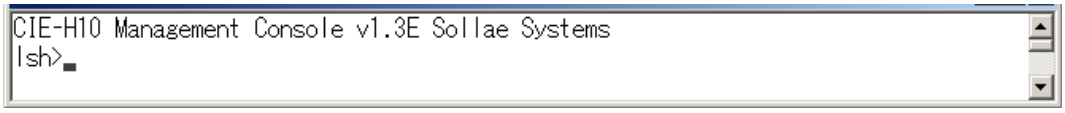

Figure 7-5 log in to the CIE-H10 on TELNET

You can check multiple states with the following commands.

Table 7-1 commands for checking states

command	option	description	usage
st	net	Network Status	lsh>st net
	sio	Serial Port Status	lsh>st sio
	uptime	System Uptime	lsh>st uptime
sc	[OP1][OP2]	Session Control	lsh>sc com1 close
sd	[OP1][OP2]	Capturing Serial Data	lsh>sd 1 100

- st net

  “st net” command displays present network states of all sessions.

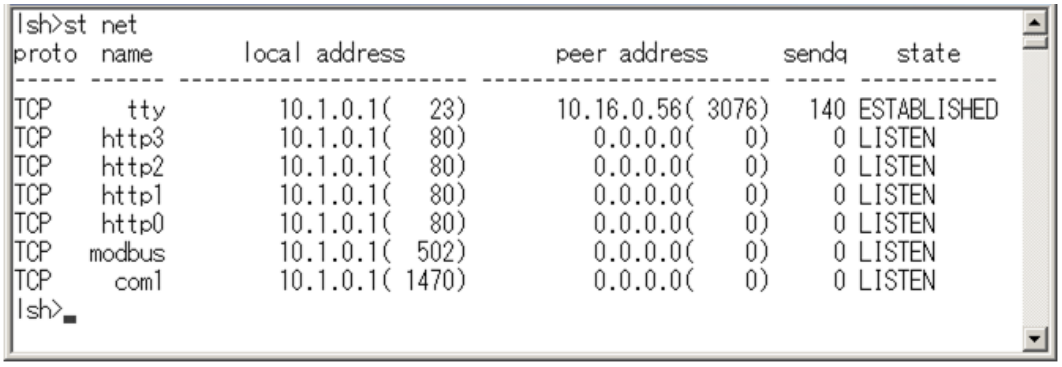
lsh>st net
proto name local address peer address sendq state
TCP tty 10.1.0.1(23) 10.16.0.56(3076) 140 ESTABLISHED
TCP http3 10.1.0.1(80) 0.0.0.0(0) 0 LISTEN
TCP http2 10.1.0.1(80) 0.0.0.0(0) 0 LISTEN
TCP http1 10.1.0.1(80) 0.0.0.0(0) 0 LISTEN
TCP http0 10.1.0.1(80) 0.0.0.0(0) 0 LISTEN
TCP modbus 10.1.0.1(502) 0.0.0.0(0) 0 LISTEN
TCP com1 10.1.0.1(1470) 0.0.0.0(0) 0 LISTEN
lsh>

Figure 7-6 “st net command”

- st sio

  "st sio" command displays the number of bytes for the serial port.

```
lsh>st sio
port fmax rbmax rxbuf txbuf   rx_count   tx_count
---- ---- ----- ----- ----- ---------- ----------
com1    1     0     0     0          8         72
lsh>
```

Figure 7-7 "st sio" command

- st uptime

  "st uptime" command shows amount of time since H10 has booted up.

```
lsh>st uptime
00:04:21.79 up 0 days
lsh>
```

Figure 7-8 "st uptime" command

- sc

  "sc" command is used when users close a session. [OP1] means the name of session, and [OP2] should be "CLOSE".

```
lsh>sc com1 close
com1: closed
lsh>
```

Figure 7-9 "sc" command

☞ *In the case of the "sc" command you should use only small letters.*

- sd

  "sd" command is for capturing serial data. [OP1] means name of the session, [OP2] means period, which has a 10ms unit, for the capture.

```
lsh>sd 1 100
com1 dump buffering time : 1000ms
lsh>rx1 <= 61 73                                        | as
tx1 => 69 66                                          | if
```

Figure 7-10 "sd" command

7.3.2 Using ezManager

Status of the CIE-H10 can be monitored by [Status] button on ezManager. By using the [Refresh Every 1 Second] option in the status window, the status is automatically updated in every second.

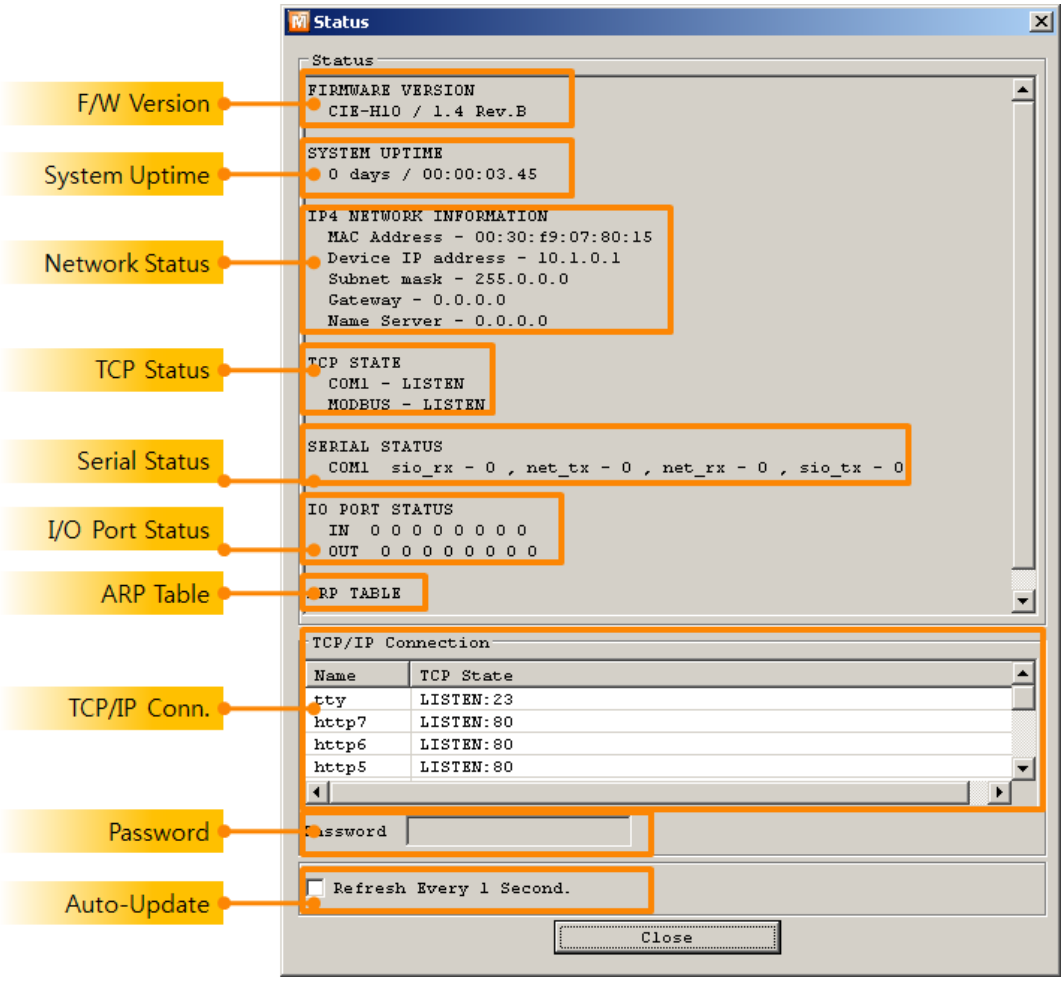

Figure 7-11 status window of ezManager

- FIRMWARE VERSION

  The name of model name and the version of firmware are displayed here.

- SYSTEM UPTIME

  Amount of time is displayed since the CIE-H10 boots up.

- IP4 NETWORK INFORMATION

  All information about related items with IP Address including the MAC address is shown here. It works even if the IP address is assigned from DHCP or PPPoE.

- TCP STATE

  TCP status of each port is shown in this section.

Table 7-2 TCP STATE

Message	Description
LISTEN	waiting for requests of a TCP connection
CLOSE	a TCP connection is closed
SYN_SENT	send "SYN" segment to make a TCP connection
ESTABLISHED	When a TCP connection is established
N/A	In UDP mode

- SERIAL STATUS

  Amount of data in every buffer is displayed. The unit is byte.

Table 7-3 SERIAL STATUS

Buffer	Description
sio_rx	The number of data which is received from the COM port
net_tx	The number of data which is sent to the remote host
net_rx	The number of data which is received from the remote host
sio_tx	The number of data which is sent to the COM port

- I/O PORT STATUS

  This represents I/O ports' status. '1' means HIGH(ON) and '0' means LOW(OFF).

- ARP TABLE

  This part shows ARP table on the CIE-H10. When a TCP connection is established or UDP data communication is performed, the information of IP and MAC address is automatically stored in the ARP table. This information is held for 1 minute. When 50 seconds is passed, the CIE-H10 starts broadcasting the ARP packet again. If there is no response until the time is 0, the information is removed. If there is a response, the time is updated 60 seconds again.

- TCP/IP Connection

  In this section, the same information with TCP STATE is displayed with IP address and port number. A difference is that users can terminate a TCP connection. When right click on a session, a small pop-up window is created.

- Password

  This text box is activated when the CIE-H10 has a password. If users want to close the TCP connection, this password has to be correctly filled.

- Refresh Every 1 Second.

  If this option is checked, ezManager sends query in every second.

8 Additional Functions

8.1 Security

8.1.1 Restriction of Access (ezTCP Firewall)

On the [Option] tab of ezManager, users can set restriction of access function with filtering MAC and IP address.

- Allowed MAC Address

  If this option has a value of MAC address, the device which has the MAC address is only permitted to access.

- Allowed IP Address

  This is for qualifying hosts with IP address or range of IP address. The range is defined by multiplying [IP address] and [Network Mask] in bit unit.

- Examples

Table 8-1 examples of defining allowed IP range

IP Address	Network Mask	Allowed IP Address Range
10.1.0.1	255.0.0.0	10.1.0.1 ~ 10.255.255.254
10.1.0.1	255.255.255.0	10.1.0.1 ~ 10.1.0.254
192.168.1.4	255.255.255.255	192.168.1.4

- Apply to ezManager

  [Apply to ezManager] is for applying above two restrictions to ezManager functions like [Search], [Read], [Write] and etc.

8.1.2 Setting Password

A password can be used for protecting the CIE-H10 from TELNET login or changing environmental parameters by hosts which are not qualified. The maximum length is 8 bytes of Alphabet or number.

☞ *When you want to revoke all of these restrictions, change the mode of the CIE-H10 to the ISP mode. All restrictions are removable and communication with ezManager is revoked in the ISP mode.*

8.2 Option Tab Functions

8.2.1 Notify IP Change

The CIE-H10 can be a TCP server even though it is assigned the IP address automatically. Using [Notify IP Change] function, it sends its IP address with the host name to the specific server. There are 3 types (DDNS, TCP and UDP) of functions provided.

- Dynamic Domain Name Service (DDNS)
  The CIE-H10 supports DDNS function offered by DynDNS to manage its changed IP address as a host name. Therefore, you have to make an account and create host names on the website of DynDNS before use this.

☞ *All about service usage of an account could be changed according to the policy of DynDNS.*

☞ *Homepage of DynDNS: http://dyn.com/dns/*

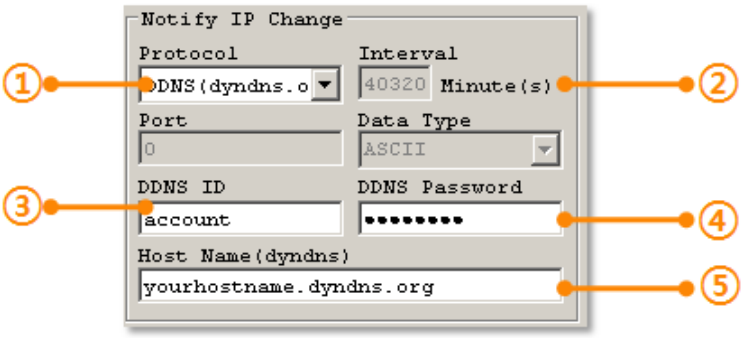

Figure 8-1 setting DDNS

① Select the [DDNS (dyndns.org)] item.
② 40,320 is a fixed value.
③ Input the ID of DDNS account.
④ Input the password of the account.
⑤ Input one of the host names which you created on your account.

- TCP/UDP
  In case you have an own server and want to manage the information about changed IP addresses, you are allowed to use TCP/UDP for using this option. The [Data Type] can be selected as ASCII or hexadecimal, and the [Interval] is available on configuration.

For more information about this, please refer to the "Notify IP Change" on the [Download] >> [Technical Documents] menu of our web site.

8.2.2 Sending MAC Address

[Sending MAC Address] is a function that the CIE-H10 sends its MAC address to the remote host right after the connection is established. By using this function, a server can identify multiple devices with the information.

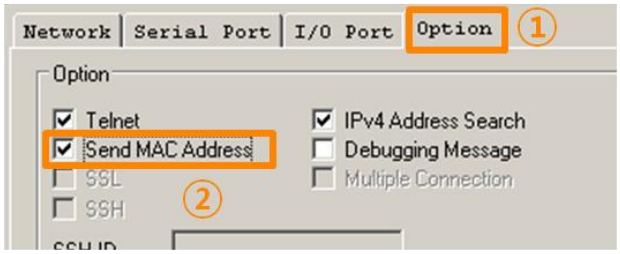

Figure 8-2 setting of Sending MAC Address function

① Move to the [Option] tab.

② Check the [Send MAC Address] option.

8.2.3 Debugging Message

By using [Debugging] option, users can receive debugging messages from the CIE-H10 on the network.

☞ *When you are facing a problem about the TCP connection or data communication, please use this function and send us the stored file. We can use it for finding out the reason of your problem.*

☞ *Debugging messages are broadcasted to entire network via UDP so it might cause serious network traffic. Remember you should turn the option off after using it.*

- Setting debugging option

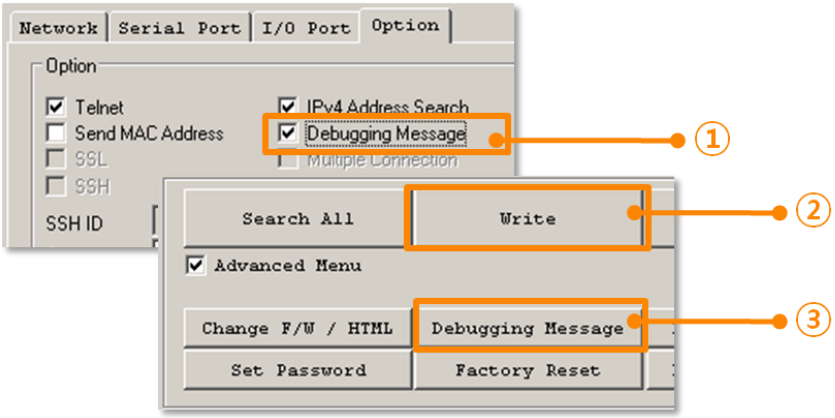

Figure 8-3 setting debugging option

① Check the [Debugging Message] option

② Press the [Write] button

③ After check the [Advanced Menu], click the [Debugging Message] button. And then, the debugging message window is shown on your screen like the figure below.

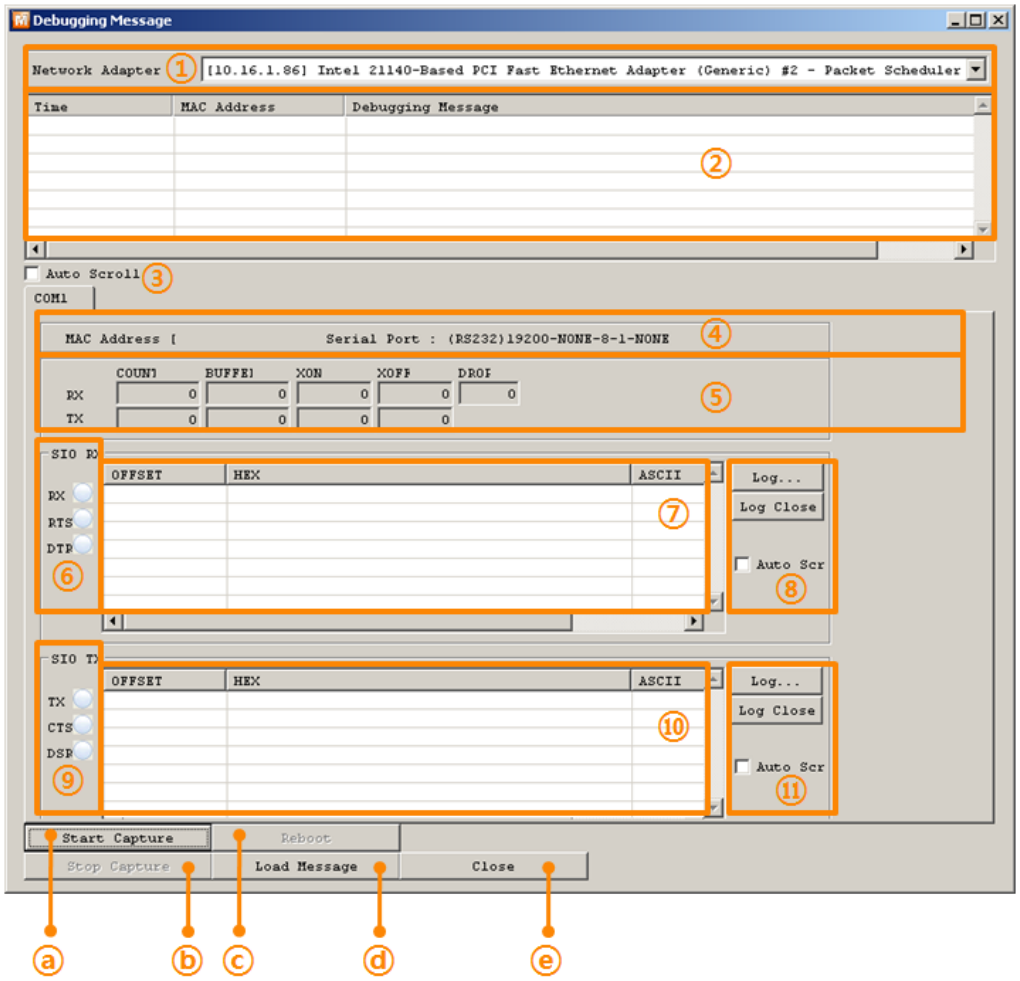

Figure 8-4 debugging message window

① Pull down menu for selecting a network adapter

② Place for showing received debugging messages from the CIE-H10 over the network

③ Auto update to display the latest captured file on the screen of ②

④ MAC Address Information of a selected message

⑤ ~ ⑪ Unavailable

ⓐ To start capturing debugging messages from the CIE-H10

ⓑ To stop capturing debugging messages from the CIE-H10

ⓒ Unavailable

ⓓ [Load Message] is for loading a debugging log file to display

ⓔ Closing debugging message window

8.3 Serial Port Tab Functions

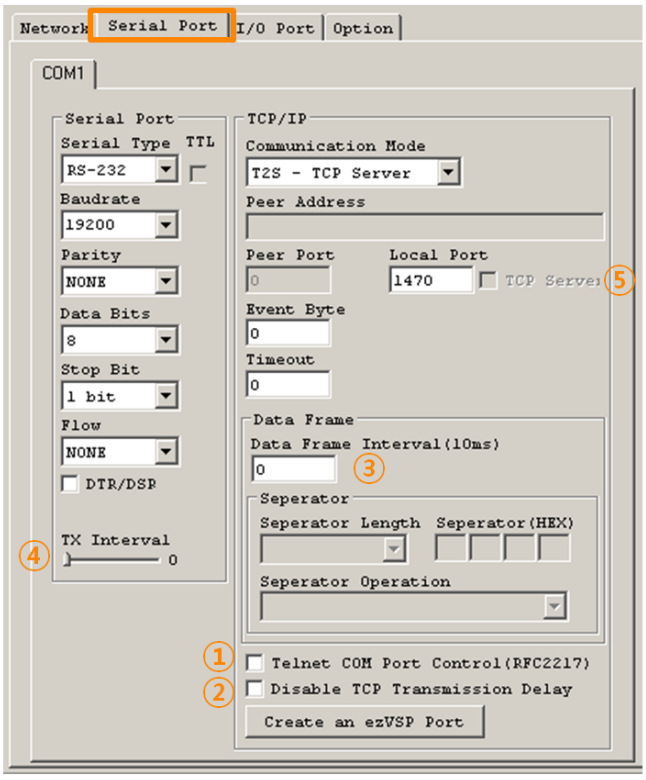

Figure 8-5 Serial Port Tab

8.3.1 TELNET COM port Control Option (RFC 2217) - ①

This option is for sending and receiving serial port states between two devices. Users can send and receive control signals such as RTS/CTS when the states are changed.

8.3.2 Disable TCP Transmission Delay - ②

If you use this option, CIE-H10 sends the data from the serial port to Ethernet as quickly as possible.

8.3.3 Data Frame Interval - ③

Before sending data from the serial port to Ethernet, ezTCP gathers data in the buffer. If there is no data during the time which is configured in the [Data Frame Interval], ezTCP will send data to the network. In case the value is set to 0, data will be sent immediately.

☞ Please set this value to 11 or higher values for correct operation.

8.3.4 TX interval - ④

This option is for preventing data loss in the case that the serial device has very small buffer size or doesn't have a buffer. The range of the value could be from 0 to 25 and the unit is duration of sending 1 byte. For example, if you set this value to 5, each byte will be

transferred with duration of sending 5 bytes.

8.3.5 TCP Server / Client mode - ⑤

This mode is available on TCP client mode only. In this mode, you don't need to change the mode for switching active or passive TCP connection. Note that the [Event Byte] option should be set to 1 or lager value.

☞ *If you want to get more information about the above functions, refer to the technical documents on the [Download] >> [Technical documents] page at our web site.*

8.4 Digital I/O Functions

8.4.1 Valid Time

The CIE-H10 only recognizes signals of the input ports as the valid signals when the signal lasts for the [Valid Time]. If the signals are not maintained during the [Valid Time], the input signals will be ignored. The unit used for the [Valid Time] is 1ms. However, because the accuracy is only guaranteed in 10ms, the designated values are rounded down in units of 10ms.

8.4.2 Delay

The CIE-H10 gives output values to the output ports after the amount of time has set in the [Delay]. If users set the value of [Delay] to 0, the CIE-H10 gives the output value to the output port immediately. The unit used for the [Delay] is 1ms. However, because the accuracy is only guaranteed in 10ms, the designated values are rounded down in units of 10ms.

☞ *If the timer for the [Delay] is already running, all the subsequent orders for giving signals to the output ports are ignored.*

9 Self-Test in Trouble

When users are in trouble with the CIE-H10, make sure of the following steps first.

9.1 Searching problem with ezManager

- Confirming types of configuration utility
  The CIE-H10 can be configured by ezManager.
- Cancelling the Firewall operation
  In case of being blocked by firewalls of personal computer or network block, you must cancel all the firewalls before searching the CIE-H10.

☞ *Most of vaccine programs have firewall functions so it can cause some trouble to search the CIE-H10. Close or pause these programs before searching the products.*

- Stable supply of the power
  Check if the power is supplied continually. The red LED on the body shows that the power is switched on.
- Connection with the network
  Make sure that the network connection is fine including Ethernet cable. In this step, we recommend that users connect the CIE-H10 with PC directly or in the same network hub.
- Checking options of restriction
  In case that restriction of access is activated, the communication with ezManager will be unavailable. When users are in this situation, make the CIE-H10 operate in ISP mode.

9.2 Connection Problem over Modbus/TCP

- Checking parameters related with TCP/IP

  When the CIE-H10 has a private network IP address, personal computer's IP address has to be the same sub network. Check if the IP address and local port number are correct. In case of a fixed IP address, the subnet mask, gateway IP address and DNS IP address should be configured.

Table 9-1 major parameters related with Modbus/TCP

Slave or Master
Local IP Address, the connection mode (Active / Passive), Peer Address and Peer Port, Subnet Mask, Gateway IP Address, DNS IP Address, DDNS option and etc.

- PING Test

  Confirm the connection over the network by PING test. If the CIE-H10 doesn't send any reply from the request, check the network environment.

- Firewall

  In case the networks which need strong security, the access may be denied by their firewall. Under this circumstance, users should ask the person in charge of their network to release ports which will be used. (Ex: TCP 502, UDP 50005)

- Operation Mode

  A TCP connection is not possible when the CIE-H10 is operating in the ISP or Serial Configuration mode.

- Connection Mode

  To make a TCP connection, both a server (passive mode) and a client (active mode) should exist. If there are only servers or clients, The TCP connection can't be established.

- ezTCP Firewall

  When users set the ezTCP firewall with MAC and IP address, any hosts can't be reachable to it except for the hosts which have the allowed MAC and IP address. Inactivate the option or check the setting is correct.

- Checking the TCP status

  TCP is a protocol connected one to one without multiple connections function. Because of this, if a device is on a TCP connection, other requests are denied. If users are in this situation, check the network status by connecting on TELNET or using ezManager.

9.3 Communication Problem over Modbus/TCP

- Checking Modbus/TCP parameters
  Check all the related parameters that [Unit ID], [Input Port Base Address], [Output Port Base Address], [Poll Interval] and [Notify Input change].
- Checking which mode is using
  In case of MACRO or serialized Modbus/TCP, you can control the outputs of the CIE-H10. Turn the mode off if those modes are using.

☞ *Contact us if you have any questions about above steps or our products.*

10 Technical Support, Warranty and Precaution

10.1 Technical Support

If you have any question regarding operation of the product, visit Customer Support FAQ corner and the message board on Sollae Systems' web site or send us an email at the following address:

- E-mail: support@eztcp.com
- Website Address for Customer Support: http://www.eztcp.com/en/support/

10.2 Warranty

10.2.1 Refund

Upon the customer's request to refund the product within two weeks after purchase, Sollae Systems will refund the product.

10.2.2 Free Repair Services

For product failures occurring within 2 years after purchase, Sollae Systems provides free repair services or exchange the product. However, if the product failure is due to user's fault, repair service fees will be charged or the product will be replaced at user's expense.

10.2.3 Charged Repair Services

For product failures occurring after the warranty period (2 years) or resulting from user's fault, repair service fees will be charged and the product will be replaced at user's expense.

10.3 Precaution

- Sollae Systems is not responsible for product failures occurring due to user's alternation of the product.
- Specifications of the product are subject to change without prior notice for performance improvement.
- Sollae Systems does not guarantee successful operation of the product if the product was used under conditions deviating from the product specifications.
- Reverse engineering of firmware and applications provided by Sollae Systems is prohibited.
- Use of firmware and applications provided by Sollae Systems for purposes other than those for which they were designed is prohibited.
- Do not use the product in an extremely cold or hot place or in a place where vibration is severe.
- Do not use the product in an environment in which humidity is high or a lot of oil exists.
- Do not use the product where there is caustic or combustible gas.
- Sollae Systems does not guarantee normal operation of the product under the conditions a lot of noise exists.
- Do not use the product for a purpose that requires exceptional quality and reliability relating to user's injuries or accidents – aerospace, aviation, health care, nuclear power, transportation, and safety purposes.
- Sollae Systems is not responsible for any accident or damage occurring while using the product.

11 History

Date	Version	Comment	Author
2007.03.22	0.5	○ Initial touch	
2007.06.11	1.0	○ Initial Release	
2007.06.28	1.1	○ Add Security Function	
2007.06.29	1.2	○ Correct Maximum Input Port Voltage	
2007.07.16	1.3	○ Change English Expressions by JJS	
2007.09.03	1.4	○ Add Telnet COM Port Control Option	
2007.09.19	1.5	○ Add DDNS(Dynamic DNS)	
2008.01.10	1.6	○ Modify Digital Input Interface's Drawing	
2008.05.28	1.7	○ Change Images, Modify ATC description ○ Add IP Change Trap, HTTP Port Number	
2008.08.06	1.8	○ Serial Parity – MARK/SPACE add	
2009.06.18	2.0	○ Add description of Serialized Modbus/TCP ○ Add description of Users Web Page ○ Add contents of new ezManager ○ Add the description of serial configuration mode ○ Add the description of U2S echo function ○ Modify the table of System LED ○ Modify most of the figures ○ Change the form of document ○ Change the home page link of Technical support ○ Reduce the contents about ezManager ○ Remove the ATC chapter ○ Correct some expressions	
2009.12.02	2.1	○ The style of document has been changed. ○ Application Diagrams have been added. ○ Operating / Storage temperature have been added. ○ The form of history has been modified. ○ Most of figures have been updated. ○ Description of "sc" command has been modified. ○ Maximum value of Event byte has been added. ○ Description of "Sending MAC Address and RFC2217 option have been modified.	Roy LEE
2009.12.14	2.2	○ The table 4-1 has been changed.	Roy LEE

2010.08.30	2.3	○ The description of the CIE-H10 has been changed. ○ Major icons have been inserted on the front cover.	Roy LEE
2011.01.20	2.4	○ Descriptions about input/output ports have been added. ○ Diagram of "Macro mode" has been added. ○ The name of caption for figures is changed.	Roy LEE
2011.08.01	2.5	○ Some expressions have been corrected or modified. ○ A caution has been added about using MACRO. ○ A figure of location of the ISP switch has been added. ○ Pictures of the configuration tool have been updated. ○ A picture of the default web server has been updated. ○ Descriptions about the new functions have been added. (FC 05, Multiple connections, write pulse and etc.) ○ Chapter 8 has been reconstructed. ○ The link for the support page has been corrected.	Roy LEE
2011.08.09	2.6	○ Maximum value of Event Byte has been corrected. ○ Figure 4-1 has been changed. ○ Descriptions of TCP Server/Client mode has been modified	Roy LEE
2011.12.14	2.7	○ Descriptions of DynDNS service has been changed. ○ Descriptions of FIFO function has been deleted.	Amy Kim
2012.02.08	2.8	○ Add recommended values of the Event Byte ○ Download link and Typo have been fixed.	Amy Kim
2012.05.23	2.9	○ A picture of the default web server has been updated. ○ Extend the warranty period to two years	Amy Kim
2012.06.25	3.0	○ Change description of network interface ○ Remove description about PPPoE and DHCP	Amy Kim
2013.02.07	3.1	○ Change voltage conditions of output port	Amy Kim